Vol. 1119 Number 4

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UNITED STATES PATENT AND TRADEMARK OFFICE

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PATENTS

October 23, 1990

U.S. DEPARTMENT F COMMERCE

Patent and Trademark Office

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1118 O.G. 14 on Sept. 11, 1990.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of March 1, 1990, and was announced in the *Official Gazette* at 1111 O.G. 24 on Feb. 20, 1990.

International PCT fees were changed on September 1, 1990 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1116 O.G. 32 on July 17, 1990.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1242.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	502.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	122.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	154.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Aug. 16, 1990

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Patent Cooperation Treaty (PCT) Update

Change in International Search Fee Charged by the European Patent Office Effective November 1, 1990

The International Bureau of the World Intell:ctual Property Organization has informed the U.S. Patent and Trademark Office that, due to changes in the exchange rate of the U.S. dollar in relation to the German mark, the dollar amount of the international search fee charged by the European Patent Office for international applications filed in the United States Receiving Office will be $1,344.00, effective November 1, 1990.

Sept. 24, 1990

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks

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Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on October 20, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,700,403 through 4,701,961
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on October 18, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,409,689 through 4,411,022
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED AUGUST 12, 1990 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,343,045	06/224,066	8/10/82
4,343,068	06/226,211	8/10/82
4,343,087	06/227,513	8/10/82
4,343,091	06/245,306	8/10/82
4,343,093	06/237,345	8/10/82
4,343,095	06/246,971	8/10/82
4,343,144	06/234,259	8/10/82
4,343,175	06/254,301	8/10/82
4,343,262	06/247,713	8/10/82
4,343,273	06/309,155	8/10/82
4,343,307	06/216,978	8/10/82
4,343,320	06/238,118	8/10/82
4,343,338	06/277,756	8/10/82
4,343,342	06/247,454	8/10/82
4,343,347	06/249,033	8/10/82
4,343,411	06/239,369	8/10/82
4,343,429	06/259,628	8/10/82
4,343,430	06/249,213	8/10/82
4,343,470	06/233,008	8/10/82
4,343,475	06/233,439	8/10/82
4,343,477	06/231,305	8/10/82
4,343,533	06/221,950	8/10/82
4,343,534	06/230,521	8/10/82
4,343,542	06/280,885	8/10/82
4,343,543	06/265,154	8/10/82
4,343,564	06/234,800	8/10/82
4,343,609	06/257,337	8/10/82
4,343,620	06/219,202	8/10/82
4,343,625	06/225,881	8/10/82
4,343,539	06/251,807	8/10/82
4,343,640	06/245,861	8/10/82
4,343,667	06/255,894	8/10/82
4,343,678	06/216,604	8/10/82
4,343,685	06/238,711	8/10/82
4,343,686	06/239,093	8/10/82
4,343,691	06/240,722	8/10/82
4,343,698	06/277,670	8/10/82
4,343,712	06/233,428	8/10/82
4,343,741	06/256,378	8/10/82
4,343,773	06/229,379	8/10/82
4,343,791	06/305,539	8/10/82
4,343,793	06/237,703	8/10/82
4,343,800	06/255,751	8/10/82
4,343,840	06/238,835	8/10/82
4,343,864	06/294,698	8/10/82
4,343,867	06/284,858	8/10/82
4,343,869	06/233,074	8/10/82
4,343,884	06/220,423	8/10/82
4,343,915	06/292,297	8/10/82
4,343,920	06/218,125	8/10/82
4,343,962	06/230,682	8/10/82
4,343,964	06/226,330	8/10/82
4,344,029	06/262,107	8/10/82
4,344,053	06/234,067	8/10/82
4,344,054	06/240,442	8/10/82
4,344,123	06/301,755	8/10/82
4,344,159	06/261,998	8/10/82
4,604,762	06/234,116	8/12/86
4,604,768	06/756,956	8/12/86
4,604,772	06/658,948	8/12/86
4,604,777	06/534,880	8/12/86
4,604,784	06/725,232	8/12/86

Patent Number	Serial Number	Issue Date
4,604,787	06/641,060	8/12/86
4,604,791	06/621,249	8/12/86
4,604,792	06/684,379	8/12/86
4,604,799	06/414,954	8/12/86
4,604,806	06/633,011	8/12/86
4,604,812	06/707,409	8/12/86
4,604,815	06/647,747	8/12/86
4,604,819	06/639,447	8/12/86
4,604,820	06/693,976	8/12/86
4,604,821	06/531,072	8/12/86
4,604,827	06/758,083	8/12/86
4,604,835	06/649,759	8/12/86
4,604,836	06/682,275	8/12/86
4,604,841	06/481,311	8/12/86
4,604,852	06/583,263	8/12/86
4,604,859	06/734,918	8/12/86
4,604,876	06/637,975	8/12/86
4,604,889	06/686,891	8/12/86
4,604,892	06/641,965	8/12/86
4,604,896	06/737,377	8/12/86
4,604,902	06/664,231	8/12/86
4,604,910	06/582,585	8/12/86
4,604,916	06/578,929	8/12/86
4,604,920	06/743,390	8/12/86
4,604,922	06/651,162	8/12/86
4,604,930	06/605,636	8/12/86
4,604,932	06/720,292	8/12/86
4,604,936	06/689,715	8/12/86
4,604,941	06/671,047	8/12/86
4,604,952	06/728,641	8/12/86
4,604,953	06/604,066	8/12/86
4,604,956	06/612,002	8/12/86
4,604,958	06/763,535	8/12/86
4,604,965	06/587,960	8/12/86
4,604,975	06/692,450	8/12/86
4,604,977	06/726,413	8/12/86
4,604,979	06/718,806	8/12/86
4,604,981	06/516,114	8/12/86
4,604,982	06/713,878	8/12/86
4,604,985	06/677,576	8/12/86
4,604,986	06/670,570	8/12/86
4,604,987	06/784,553	8/12/86
4,604,991	06/773,251	8/12/86
4,604,995	06/595,259	8/12/86
4,604,998	06/598,994	8/12/86
4,605,002	06/585,929	8/12/86
4,605,013	06/575,169	8/12/86
4,605,014	06/537,584	8/12/86
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4,605,026	06/482,668	8/12/86
4,605,031	06/618,196	8/12/86
4,605,038	06/728,332	8/12/86
4,605,047	06/557,146	8/12/86
4,605,053	06/647,626	8/12/86
4,605,055	06/662,968	8/12/86
4,605,057	06/520,518	8/12/86
4,605,061	06/625,429	8/12/86
4,605,063	06/609,327	8/12/86
4,605,067	06/593,394	8/12/86
4,605,068	06/331,761	8/12/86
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4,605,086	06/664,900	8/12/86
4,605,089	06/500,920	8/12/86
4,605,098	06/695,381	8/12/86
4,605,104	06/745,821	8/12/86
4,605,113	06/603,647	8/12/86
4,605,114	06/692,496	8/12/86
4,605,115	06/575,129	8/12/86
4,605,122	06/668,756	8/12/86
4,605,125	06/558,396	8/12/86
4,605,132	06/607,227	8/12/86
4,605,134	06/716,034	8/12/86
4,605,135	06/791,069	8/12/86
4,605,137	06/719,471	8/12/86
4,605,138	06/719,472	8/12/86
4,605,141	06/707,203	8/12/86
4,605,145	06/689,866	8/12/86
4,605,149	06/725,218	8/12/86
4,605,151	06/754,614	8/12/86
4,605,173	06/596,651	8/12/86
4,605,180	06/640,468	8/12/86
4,605,181	06/714,724	8/12/86
4,605,184	06/513,179	8/12/86
4,605,199	06/649,891	8/12/86
4,605,203	06/707,962	8/12/86
4,065,208	06/719,981	8/12/86
4,605,209	06/697,734	8/12/86
4,605,217	06/720,286	8/12/86
4,605,219	06/609,823	8/12/86
4,605,222	06/661,107	8/12/86
4,605,225	06/606,152	8/12/86
4,605,231	06/652,089	8/12/86
4,605,234	06/808,943	8/12/86
4,605,239	06/622,748	8/12/86
4,605,240	06/524,445	8/12/86
4,605,245	06/613,075	8/12/86
4,605,249	06/454,998	8/12/86
4,605,256	06/664,568	8/12/86
4,605,257	06/742,285	8/12/86
4,605,258	06/615,698	8/12/86
4,605,261	06/687,240	8/12/86
4,605,265	06/642,111	8/12/86
4,605,270	06/693,291	8/12/86
4,605,278	06/737,830	8/12/86
4,605,281	06/571,627	8/12/86
4,605,292	06/749,722	8/12/86
4,605,293	06/582,787	8/12/86
4,605,303	06/565,481	8/12/86
4,605,304	06/531,180	8/12/86
4,605,305	06/509,814	8/12/86
4,605,310	06/699,473	8/12/86
4,605,312	06/699,998	8/12/86
4,605,314	06/569,883	8/12/86
4,605,317	06/552,269	8/12/86
4,605,328	06/612,442	8/12/86
4,605,333	06/682,426	8/12/86
4,605,334	06/552,666	8/12/86
4,605,345	06/614,437	8/12/86
4,605,348	06/437,542	8/12/86
4,605,350	06/545,273	8/12/86
4,605,368	06/749,214	8/12/86
4,605,374	06/757,510	8/12/86
4,605,379	06/769,977	8/12/86
4,605,380	06/711,371	8/12/86
4,605,393	06/695,111	8/12/86
4,605,395	06/570,686	8/12/86
4,605,397	06/694,019	8/12/86
4,605,410	06/710,313	8/12/86
4,605,414	06/617,742	8/12/86
4,605,431	06/685,873	8/12/86
4,605,434	06/630,131	8/12/86
4,605,449	06/695,386	8/12/86
4,605,475	06/695,440	8/12/86
4,605,481	06/738,781	8/12/86
4,605,487	06/654,813	8/12/86
4,605,492	06/793,134	8/12/86
4,605,501	06/754,240	8/12/86
4,605,504	06/730,422	8/12/86
4,605,512	06/478,901	8/12/86
4,605,514	06/653,748	8/12/86
4,605,515	06/664,455	8/12/86
4,605,531	06/442,645	8/12/86
4,605,552	06/631,049	8/12/86
4,605,563	06/663,018	8/12/86
4,605,581	06/767,397	8/12/86
4,605,587	06/350,544	8/12/86
4,605,604	06/745,979	8/12/86
4,605,612	06/706,354	8/12/86
4,605,618	06/512,629	8/12/86
4,605,620	06/442,093	8/12/86
4,605,639	06/755,986	8/12/86
4,605,648	06/766,100	8/12/86
4,605,654	06/809,698	8/12/86
4,605,657	06/728,997	8/12/86
4,605,665	06/706,588	8/12/86

Patent No.	Serial No.	Issue Date
4,605,667	06/717,544	8/12/86
4,605,668	06/599,625	8/12/86
4,605,673	06/562,690	8/12/86
4,605,681	06/747,831	8/12/86
4,605,685	06/648,018	8/12/86
4,605,704	06/541,229	8/12/86
4,605,711	06/665,676	8/12/86
4,605,738	06/550,219	8/12/89
4,605,739	06/608,957	8/12/86
4,605,748	06/601,461	8/12/86
4,605,760	06/766,376	8/12/86
4,605,761	06/805,689	8/12/86
4,605,764	06/513,215	8/12/86
4,605,769	06/743,753	8/12/86
4,605,771	06/604,365	8/12/86
4,605,791	06/743,471	8/12/86
4,605,822	06/644,088	8/12/86
4,605,831	06/737,862	8/12/86
4,605,846	06/586,918	8/12/86
4,605,852	06/534,189	8/12/86
4,605,909	06/343,147	8/12/86
4,605,913	06/508,873	8/12/86
4,605,918	06/713,944	8/12/86
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4,605,961	06/565,023	8/12/86
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4,605,985	06/773,134	8/12/86
4,605,993	06/683,343	8/12/86
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4,606,064	06/612,165	8/12/86
4,606,071	06/639,800	8/12/86

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1), and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptence Date
4,541,443	06/492,808	9/17/85	5/09/83	9/14/90
4,550,554	06/567,661	11/05/85	1/03/84	9/13/90

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b).

4,653,276, Re. S. N. 07/577,067, Filed Sept. 4, 1990, Cl. 60, AUTOMATIC CONTROL SYSTEM FOR THERMAL POWER PLANT, Akira Sugano, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan*, Attorney or Agent: Melvin Kraus, Ex. Gp.: 346

4,731,598, Re. S. N. 07/578,177, Filed Aug. 30, 1990, Cl. 335/306, PERIODIC PERMANANT MAGNET STRUCTURE WITH INCREASED USEFUL FIELD, John P. Clarke, Owner of Record: *United States, Represented by the Secretary of the Army*, Attorney or Agent: Anthony T. Lane, Ex. Gp.: 216

4,764,178, Re. S. N. 07/549,292, Filed July 5, 1990, Cl. 8/471, THERMAL TRANSFER PRINTING: HETERO-AROMATIC AZO DYE, Peter Gregory, et al., Owner of Record: *Imperial Chemical Industries Plc., London, England*, Attorney or Agent: Paul N. Kokulis, Ex. Gp.: 115

4,771,086, Re. S. N. 07/581,545, Filed Sept. 12, 1990, Cl. 523/205, ENCAPSULATING FINELY DIVIDED SOLID PARTICLES IN STABLE SUSPENSIONS, Robert W. Martin, Owner of Record: *Union Carbide Corp., Danbury, Conn.*, Attorney or Agent: Sarah A. Kagan, Ex. Gp.: 151

4,781,323, Re. S. N. 07/570,003, Filed Aug. 20, 1990, Cl. 229/123, RECLOSABLE CLOSURE ASSEMBLY FOR CONTAINER, Terri A. Elias, et al., Owner of Record: *Minnesota Mining and Manufacturing Co., Saint Paul, Minn.*, Attorney or Agent: David L. Weinstein, Ex. Gp.: 241

4,805,525, Re. S. N. 07/554,456, Filed July 19, 1990, Cl. 99/408, APPARATUS FOR FILTERING LIQUIDS, Thomas H. Bivens, Owner of Record: *Inventor*, Attorney or Agent: Neal S. Mosely, Ex. Gp.: 242

4,865,354, Re. S. N. 07/580,797, Filed Sept. 11, 1990, Cl. 285/18, CONDUCT COUPLER, Jerry L. Allen, Owner of Record: *Inventor*, Attorney or Agent: Frederick K. Lacher, Ex. Gp.: 351

4,868,077, Re. S. N. 07/571,186, Filed Aug. 21, 1990, Cl. 430/58, LAYERED PHOTOSENSITIVE MATERIAL FOR ELECTROPHOTOGRAPHY COMPRISING SELENIUM, ARSENIC AND TELLURIUM, Mitsuri Narita, Owner of Record: *Fuji Electric Co., Ltd., Kawasaki-Ku, Japan*, Attorney or Agent: Ronald B. Hudreth, Ex. Gp.: 156

4,914,521, Re. S. N. 07/581,578, Filed Sept. 12, 1990, Cl. 358/229, STERILIZABLE VIDEO CAMERA COVER, Edwin L. Adair, Owner of Record: *Inventor*, Attorney or Agent: Gary D. Fields, Ex. Gp.: 261

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,892,042, Reexam. No. 90/002,135, Requested Sept. 13, 1990, Cl. 033/301, ELECTRONIC RUN-OUT COMPENSATOR AND METHOD OF ELECTRONICALLY COMPENSATING FOR WOBBLE RUN-OUT IN A ROTATING BODY, David A. Senften, Owner of Record: *Hunter Engineering Co., Bridgeton, Mo.*, Attorney or Agent: Stephen F. Brauer, Bridgeton, Mo., Ex. Gp.: 246, Requester: David R. Fairbairn, Minneapolis, Minn.

4,118,754, Reexam. No. 90/002,131, Sept. 10, 1990, Cl. 361/355, ELECTRICAL PANEL HAVING MOLDED BASE PAN, J.E. Duggan, Owner of Record: *Siemens Corp., Iselin, N.J.*, Attorney or Agent: Ostrolenk, Faber, Gerb & Soffen, New York, N.Y., Ex. Gp.: 214, Requester: General Electric Corp., Plainville, Conn., and Square D. Co., Palatine, Ill.

4,167,769, Reexam. No. 90/002,132, Requested Sept. 10, 1990, Cl. 361/355, PANELBOARD HAVING DISTRIBUTED NEUTRAL, Roger D. Luke, et al., Owner of Record: *Seimens Corp., Iselin, N.J.*, Attorney or Agent: Ostrolenk, Faber, Gerb & Soffen, New York, N.Y., Ex. Gp.: 214, Requester: General Electric Corp., Plainfield, Conn., and Square D Co., Palatine, Ill.

4,325,984, Reexam. No. 90/002,138, Requested Sept. 17, 1990, Cl. 427/038, PLASMA PASSIVATION TECHNIQUE FOR THE PREVENTION OF POST-ETCH CORROSION OF PLASMA-ETCHED ALUMINUM FILMS, C.H. Galfo, et al., Owner of Record: *Fairchild Semiconductor Corp., Santa Clara, Calif.*, Attorney or Agent: Michael J. Pollock, Limbach, Limbach & Sutton, San Francisco, Calif., Ex. Gp.: 131, Requester: Owner

4,483,737, Reexam. No. 90/002,137, Sept. 14, 1990, Cl. 156/643, METHOD AND APPARATUS FOR PLASMA ETCHING A SUBSTRATE, Thomas D. Mantei, Owner of Record: *Sematech, Inc., Austin, Tex.*, Attorney or Agent: Floyd R. Nation, Arnold, White & Durkee, Houston, Tex., Ex. Gp.: 134, Requester: Owner

4,571,850, Reexam. No. 90/002,139, Requested Sept. 14, 1990, Cl. 034/242, CENTRIFFUGAL WAFER, James R. Hunt, et al., Owner of Record: *Verteq, Inc., Anaheim, Calif.*, Attorney or Agent: Lowell Anderson, Knobbe, Martens, Olson & Bear, Newport Beach, Calif., Ex. Gp.: 344, Requester: Owner

4,598,704, Reexam. No. 90/002,136, Requested Sept. 13, 1990, Cl. 138/423R, AEROSOL INHALATION DEVICE, Maurice E. Bordon, et al., Owner of Record: *Cadema Medical Products, Inc., Middletown, N.Y.*, Attorney or Agent: Leonard Bloom, Towson, Md., Ex. Gp.: 335, Requester: Owner

4,896,955, Reexam. No. 90/002,133, Sept. 12, 1990, Cl. 351/041, EYEGLASS FRAME INCLUDING SHAPE-MEMORY ELEMENTS, Robert B. Zider, et al., Owner of Record: *CVI/Beta Ventures, Inc., Menlo Park, Calif.*, Attorney or Agent: Burns, Doane, Swecker & Mathis, Menlo Park, Calif., Ex. Gp.: 257, Requester: TWRA Lp., Lake Success, N.Y.

4,929,749, Reexam. No. 90/002,134, Requested Sept. 12, 1990, Cl. 560/079, PRODUCTION OF TEREPHTHALATE ESTERS BY DEGRADATIVE TRANSESTERIFICATION OF SCRAP OR VIRGIN TEREPHTHALATE POLYESTERS, Ved P. Gupta, et al., Owner of Record: *Synergistics Industries Ltd., Mississagua, Ontario, Canada*, Attorney or Agent: Larson & Taylor, Arlington, Va., Ex. Gp.: 126, Requester: Owner

Errata

"All reference to Patent No. 4,955,364 to Dororthy C. White et al. of Ill. for 'FRUCTOSE SYRUPS AND SWEETENED BEVERAGES' appearing in the Official Gazette of Sept. 11, 1990 should be deleted since no patent was granted."

"All reference to Patent No. 4,955,642 to Joseph Dugast of France for 'PINE CONNECTOR, IN PARTICULAR FOR GASES' appearing in the Official Gazette of Sept. 11, 1990 should be deleted since no patent was granted."

REGISTRATION TO PRACTICE

The following list contains the names of persons who successfully passed the examination given on April 4, 1990. Persons entitled at this time to receive provisional recognition pursuant to 37 CFR § 10.9(a) have been given the same to prepare and prosecute patent applications before the Office until their registration certificates are maailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. 37 CFR § 10.7(a). Accordingly, any information tending to affect the eligibility of any of the following persons on moral, ethical or other grounds should be furnished to the Director of Enrollment and Discipline on or before Dec. 6, 1990.

Brun, Heidi M., 7 E. Ben Yehuda St., Rehovot, Israel
Deshmuku, Jayadeep R., 2473 Overlook Rd., #9, Cleveland Hgts., Ohio 44106
Douglas, Walter M., 1008 Greenfield Ln., Mt. Prospect, Ill., 60056
Jandacek, James W., 2500 Lakeview, No. 2304, Chicago, Ill. 60614
Levine, Robin S., 6576 Cross Creek Trail, Brecksville, Ohio 44141
Marcus, Brian I., 253 W. 72nd St. #2205, New York, N.Y. 10023
Mills, Demetra J., 6881 Brian Michall Ct., Springfield, Va. 22153
Murphy, James J., 6161 Pineland Dr., #1116, Dallas, Tex. 75231
Power, David J., 15 Second St., #5, Sausalito, Calif. 94965

Sept. 26, 1990 CAMERON WEIFFENBACH, *Director*
Office of Enrollment and Discipline

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Pestco, Inc., Greensboro, N.C., Reg. No. 1,481,072, for the mark "BESCO FOR FLEAS" and design, Canc. No. 18,353.

Commonwealth Food Specialities, Ltd., Portland, Oreg., Reg. No. 1,466,487, for the mark "TOUT. SWEET" (stylized), Canc. No. 18,668.

JEAN BROWN
Administrator of the
Trademark Trial and
Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for
Trademarks

ADVERSE DECISIONS IN INTERFERENCE

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees are not entitled to patents containing the claims listed.

Patent No. 4,257,885, Robert W. Grose, Edith M. Flanigen, NOVEL ZEOLITE COMPOSITIONS AND PROCESSES FOR PREPARING AND USING THE SAME, Interference No. 101,549, decided March 23, 1990, claims 1-4, 7, 10 and 13.

Patent No. 4,343,353, John Tsopelas, AUTOMOBILE RADIATOR FILTER, Interference No. 102,390, decided Sept. 5, 1990, claims 1, 2, 11, 12 and 21.

Patent No. 4,426,299, Martin W. Verbruggen, CONCENTRATED FABRIC SOFTENING COMPOSITION, Interference No. 101,537, decided Aug. 23, 1989, claims 1-8.

Patent No. 4,452,925, Petr Kuzma, Giovanina Odorisio, BIOLOGICALLY STABILIZED COMPOSITIONS COMPRISING COLLAGEN AS THE MINOR COMPONENT WITH

ETHYLENICALLY UNSATURATED COMPOUNDS USED AS CONTACT LENSES, Interference No. 102,006, decided July 25, 1990, claims 1-29.

Patent No. 4,582,412, Tsutomu Wakabayashi, AUTOMARTIC EXPOSURE CONTROL APPARTUS FOR SINGLE LENS REFLEX CAMERA, Interference No. 102,145, decided July 12, 1990, claims 1-8.

Patent No. 4,653,543, Robert L. Brown, LOOM REED SERVICING APPARATUS AND METHOD, Interference No. 101,811, decided Dec. 27, 1989, claims 1-4.

Patent No. 4,653,543, Robert L. Brown, LOOM REED SERVICING APPARATUS AND METHOD, Interference No. 101,917, decided Dec. 27, 1989, claim 5.

Patent No. 4,654,205, Gordon M. Cameron, SULPHUR TRIOXIDE ABSORPTION APPARATUS AND PROCESS, Interference No. 102,008, decided May 17, 1990, claims 1-4.

Patent No. 4,654,421, Yasuyuki Tanaka, Haruyoshi Takatsu, Kiyohumi Takeuchi, 4-SUBSTITUTED PHENYL CROTYL ETHER DERIVITITVE, Interference No. 102,313, decided Aug. 3, 1990, claim 1.

Patent No. 4,681,159, Roger P. Allwin, Mark Budke, SETTING TOOL FOR A WELL TOOL, Interference No. 101,907, decided May 24, 1990, claims 1-9.

Patent No. 4,705,373, Kouichi Ohmori, CHARGE COMPLETION CONFIRMING DEVICE FOR FLASH LIGHT DEVICES, Interference No. 102,381, decided July 25, 1990, claims 4, 5, 7 and 8.

Patent No. 4,731,598, John P. Clarke, PERIODIC PERMANENT MAGNET STRUCTURE WITH INCREASED USEFUL FIELD, Inteference No. 102,262, decided Sept. 13, 1990, claims 1-4 and 9-16.

Patent No. 4,757,585, Juhani Niskanen, VARIABLE-CROWN ROLL, Interference No. 102,265, decided Aug. 21, 1990, claims 13-15.

Patent No. 4,777,997, William D. Corbett, EVAPORABLE FOAM PATTERN FOR CYLINDER BLOCK OF A TWO-CYCLE ENGINE, Interference No. 102,176, decided July 19, 1990, claims 1-7, 12 and 13.

Patent No. 4,783,446, Michael Neushul, METHOD FOR THE TREATMENT OF AIDS VIRUS AND OTHER RETROVIRUSES, Interference No. 102,137, decided July 31, 1990, claims 1-10.

Patent No. 4,801,456, Keith A. Drengler, GROWTH HORMONE-RELEASING FACTOR ANALOGS, Interference No. 102,286, decided Sept. 11, 1990, claims 1-15.

Patent No. 4,813,248, Dennis E. Smith, John J. A. Williams, Gerald D. Duncan, Graeme D. Thomas, John G. Borrows, Frank W. Shacklock, DRIVES FOR CLOTHES WASHING MACHINES, Interference No. 102,230, decided July 31, 1990, claims 1-5, 13-15 and 25.

NANNIE B. HENRY, *Deputy Clerk*
Board of Patent Appeals & Interferences
(703) 557-4005

PATENT NOTICES

Certificates of Correction For Week of October 23, 1990

D. 303,537	4,849,513	4,867,317	4,879,672
Re. 33,128	4,849,798	4,867,561	4,880,067
3,894,050	4,849,935	4,867,626	4,880,437
3,899,292	4,850,315	4,868,773	4,880,722
4,535,448	4,851,277	4,868,794	4,880,777
4,599,265	4,851,554	4,869,282	4,881,133
4,723,177	4,851,705	4,869,716	4,881,342
4,758,472	4,851,923	4,870,073	4,881,697
4,770,674	4,852,727	4,870,138	4,882,357
4,772,619	4,855,147	4,870,243	4,882,441
4,781,016	4,856,269	4,870,299	4,883,334
4,791,783	4,857,465	4,870,480	4,883,600
4,791,989	4,857,547	4,870,621	4,884,081
4,793,236	4,857,652	4,870,803	4,884,331
4,800,429	4,857,697	4,871,092	4,884,826
4,805,622	4,857,817	4,871,295	4,885,091
4,814,277	4,857,951	4,871,713	4,885,386
4,815,985	4,858,768	4,871,869	4,885,577
4,820,693	4,859,000	4,871,878	4,885,588
4,820,799	4,859,093	4,872,117	4,885,826
4,822,218	4,859,583	4,872,632	4,885,858
4,823,764	4,859,664	4,873,019	4,886,157
4,826,392	4,860,398	4,873,031	4,886,215
4,827,163	4,861,174	4,873,216	4,886,272
4,827,595	4,861,586	4,873,413	4,886,859
4,827,943	4,861,711	4,874,366	4,886,867
4,832,490	4,863,029	4,874,641	4,886,909
4,832,518	4,863,560	4,876,391	4,886,938
4,832,729	4,863,569	4,876,462	4,886,994
4,834,945	4,863,674	4,877,335	4,887,058
4,836,091	4,863,993	4,878,298	4,888,365
4,837,634	4,864,414	4,878,329	4,889,647
4,840,821	4,864,438	4,878,531	4,890,100
4,841,823	4,864,703	4,878,593	4,890,898
4,844,164	4,864,967	4,878,890	4,892,245
4,844,974	4,865,327	4,878,932	4,920,337
4,845,194	4,865,420	4,878,949	4,928,274
4,846,946	4,865,921	4,879,013	4,930,173
4,847,072	4,866,065	4,879,236	4,932,756
4,847,440	4,866,130	4,879,239	4,940,962
4,849,409	4,867,118	4,879,501	
4,849,485	4,867,190	4,879,541	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
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Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent application *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
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Box Assignments	All assignment documents except those filed in new patent applications.
Box SEQUENCE	All application papers, computer readable forms and fees related to applications containing nucleotide sequence and/or amino acid sequence disclosures in accordance with 37 CFR §§ 1.821 through 1.825.

Reference Collection of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effective access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

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New Jersey	Newark Public Library	(201) 733-7782
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	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
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	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext.2587
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	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF August 25, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director.	7-7-87
ORGANIC CHEMISTRY GROUP 120—JOHN F. TERAPANE, JR., Director	11-21-88
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP— 130 BARRY S. RICHMAN, Director	5-12-88
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	12-14-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	4-23-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—ROBERT E. GARRETT, Director	8-15-88
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	3-29-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	12-22-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director.	9-18-88
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP— 260 STEWART LEVY, Acting Director	4-25-88
DESIGN, GROUP 290—ROBERT E. GARRETT, Director	1-21-87
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-3-89
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	6-23-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	10-25-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	3-16-89
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350— A. L. SMITH, Director	10-1-89

Expiration of patents: The patents within the range of numbers indicated below expire during August 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,750,192 to 3,755,818 inclusive
Plant Patents ..... 3,385 to 3,394 inclusive

REEXAMINATIONS

OCTOBER 23, 1990

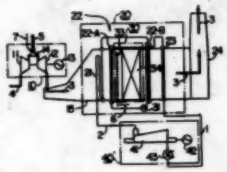
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,466,241 (1374th)

WASTE HEAT RECOVERY BOILER

Taiji Inui, Hitachi, and Makoto Sasaki, Morioka, both of Japan, assignors to Hitachi Ltd., Tokyo, Japan

Reexamination Request No. 90/001,545, Jun. 30, 1988.
Reexamination Certificate for Patent No. 4,466,241, issued Aug. 21, 1984, Ser. No. 4,266, Jan. 17, 1979.
Claims priority, application Japan, Jan. 18, 1978, 53-3381
Int. Cl.³ F02C *6/18*
U.S. Cl. 60—39.182



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

1. A waste heat recovery boiler comprising a gas passage for conducting a flue gas discharged from a gas turbine, an economizer for preheating feedwater by the flue gas, an evaporator for evaporating the preheated feedwater, and a superheater for generating steam for driving a steam prime mover by heating the evaporated feedwater, the economizer, the evaporator and the superheater being successively arranged in a direction from a downstream side to upstream side of the gas passage, characterized by dividing the evaporator into two sections in a zone in which a flue gas temperature is 300° to 450° C. in the gas passsage, and providing an apparatus for removing NO_x by a chemical reaction from the flue gas in a space in the gas passage between the two divided sections of the evaporator.

REISSUES

OCTOBER 23, 1990

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,394

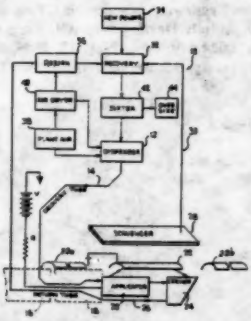
SYSTEM FOR INSIDE POWDER STRIPING OF WELDED FOOD CANS

Robert D. Payne, Countryside; James E. Pazak, Westchester, and Wesley J. Szpitalak, Palos Park, all of Ill., assignors to Continental Can Company, Inc., Del.

Original No. 4,205,621, dated Jun. 3, 1980, Ser. No. 2,033, Jan. 8, 1979. Application for reissue Jul. 11, 1989, Ser. No. 378,276

Int. Cl.[5] B05B *5/02*

U.S. Cl. 118—622 **23 Claims**



20. A continuous closed loop powder stripe application system for electrostatically applying powder to inner surfaces of can bodies moving along a predetermined linear path in spaced end to end relation, said system comprising:

an applicator for applying a stripe of powder to an inner surface of each can body;

a catcher for receiving excess powder, said catcher being disposed adjacent to said applicator downstream of said applicator along said linear path of movement of can bodies, said applicator and said catcher being positioned for being successively surrounded by can bodies moving along said linear path;

a scavenger for receiving powder dispensed between can bodies, said scavenger being disposed outside of said linear path of can bodies;

a recovery unit for receiving powder from said scavenger and said catcher;

a return system between said catcher and said recovery unit to transport powder from said catcher to said recovery unit;

means connecting said scavenger to said recovery unit to permit powder collected in said scavenger to flow to said recovery unit;

a new powder supply connected to said system in accordance with powder utilization;

a dispenser for receiving powder from said recovery unit; and

a delivery tube for delivering powder from said dispenser to said applicator.

Re. 33,395

ANKLE BRACE

Rick E. Peters, 1436 Hepburn Ave. Apt. 1, Louisville, Ky. 40204

Original No. 4,510,927, dated Apr. 16, 1985, Ser. No. 484,880, Apr. 14, 1983. Application for reissue Jul. 17, 1989, Ser. No. 383,974

Int. Cl.[5] A61F *3/00*

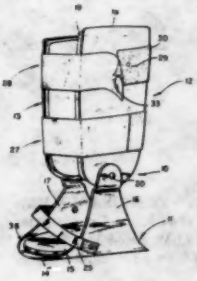
U.S. Cl. 128—80 H **14 Claims**

1. An ankle brace apparatus for restricting inversion and eversion while permitting plantoflexion and dorsiflexion, said apparatus comprising:

a substantially rigid heel stirrup having a heel portion and a pair of upstanding inner and outer side portions, the heel portion and side portions being configured to be received about a person's foot with the side portions extending upwardly along opposite sides of the foot and overlying the ankle bones;

an inner padded member pivotally connected with the inner side portion of said heel stirrup and configured to be received adjacent the inside of the lower portion of the person's leg, said inner padded member including a substantially rigid support member and padding mounted to the support member and facing the person's leg;

an outer padded member pivotally connected with the outer side portion of said heel stirrup and configured to be received and adjacent the outside of the lower portion of the person's leg, said outer padded member including a substantially rigid support member and padding mounted to the support member and facing the person's leg;



first connection means for pivotally connecting the inner padded member with the inner side portion of said stirrup with a first pivotal axis located adjacent and extending through the person's inner ankle bone;

second connection means for pivotally connecting the outer padded member with the outer side portion of said stirrup with a second pivotal axis located adjacent and extending through the person's outer ankle bone, the [first] *second* pivotal axis being spaced closer than the [second] *first* pivotal axis to the heel portion of said heel stirrup;

first attachment means for attaching said heel stirrup to the person's foot, said first attachment means including strap means for connection to each of the side portions and for being secured together overlying the front, upper surface of the person's foot; and

second attachment means for attaching said inner and outer padded members to the person's leg with the padding resting against the inner and outer portions, respectively, of the lower leg.

Re. 33,396

LITERATURE APPLYING MECHANISM

Helmut Voltmer, Park Ridge; Alfred F. Schwenzer, Totowa, and Edward J. Mazur, Montville, all of N.J., assignors to New Jersey Machine Inc., Fairfield, N.J.

Original No. 4,610,753, dated Sep. 9, 1986, Ser. No. 752,131, Jul. 5, 1985. Continuation-in-part of Ser. No. 628,761, Jul. 9, 1984, Pat. No. 4,555,299, which is a continuation-in-part of Ser. No. 542,731, Oct. 17, 1983, Pat. No. 4,502,910. Application for reissue Sep. 28, 1987, Ser. No. 101,644

Int. Cl.[5] B32B *31/04*

U.S. Cl. 156—552 6 Claims

1. A system for applying a piece of literature to an object, said system comprising:

means for pressing the piece of literature against the object;

[a hopper] *means* for storing pieces of literature;

means for moving a tape having an adhesive coating to said pressing means;

suction cup means movable between a first position in which said suction cup means picks up, by a vacuum, the piece of literature from said [hopper] *storing means* and a second position in which said suction cup means delivers said piece of literature onto said adhesive coating of said tape and said vacuum is terminated; and

stationary means disposed adjacent said second position for urging said tape toward said suction cup means and against said piece of literature as said suction cup means deliver said piece of literature onto said adhesive coating of said tape.

Re. 33,397

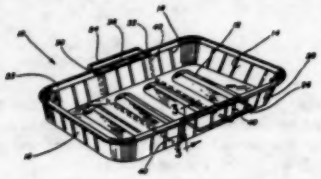
DISPOSABLE PAN

Gary P. Anders, 1964 Keats Crt., Highland Park, Ill. 60035

Original No. 4,717,038, dated Jan. 5, 1988, Ser. No. 11,036, Feb. 5, 1987. Application for reissue Dec. 18, 1989, Ser. No. 452,640

Int. Cl.[5] B65D *5/46*

U.S. Cl. 220—94 R 21 Claims



13. An oven pan, which comprises:

a disposable stamped aluminum pan structure having a bottom, side walls and a rim at the periphery of the side walls, said stamped aluminum having a thickness of between 0.003 inch and 0.005 inch;

a first handle having a generally U-shaped and fastened to the rim at a first location thereof;

first means fastening said first handle at the ends of the U of two spaced points on the rim;

first stabilizing means bridging said two spaced points; a second handle having a generally U-shape fastened to the rim at a second location thereof, opposed to said first location;

second means fastening said second second handle at the ends of the U to two spaced points on the rim;

second stabilizing means bridging said last-mentioned two spaced points;

said first and second stabilizing means each comprising an elongated bar;

said support means attached to the elongated bars and extending from said first handle to said second handle and underlying the bottom of said pan, said support means comprising a pair of wires formed to extend adjacent the outside of the side walls and under and adjacent the bottom of the pan; and

said handles and said stabilizing means being formed of steel.

Re. 33,398

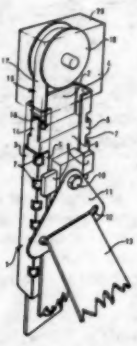
SEAT BELT FITTING

Hans-Joachim Grunewald, Kiebitzreihe, Fed. Rep. of Germany, assignor to Autoliv Development AB, Vargarda, Sweden

Original No. 4,624,479, dated Nov. 25, 1986, Ser. No. 673,867, Nov. 21, 1984. Application for reissue Nov. 23, 1988, Ser. No. 275,492

Int. Cl.[5] B60R *22/00*

U.S. Cl. 280—808 18 Claims



11. A seat belt arrangement comprising a tube guide element through which part of the seat belt passes, the guide element being mounted on a carriage that is movable along a rail or the like, the carriage being provided with means to selectively retain or lock the carriage in a plurality of positions along said rail, means being provided to impart a bias to the carriage against any bias applied thereto by the seat belt, characterized in that said bias imparting means comprises a spring strip, the opposed ends of which are respectively connected to the carriage and retained at a substantially predetermined position, one end of the spring strip being wound into a spiral, the spiral portion being retained within a cavity.

Re. 33,399

TENSION CONTROL FOR WEB HANDLING APPARATUS

William J. Alexander, III, P.O. Box 843, Mauldin, S.C. 29662

Original No. 4,588,931, dated May 13, 1986, Ser. No. 638,534, Aug. 6, 1984. Continuation of Ser. No. 454,699, Dec. 30, 1982, abandoned. Application for reissue Jul. 16, 1986, Ser. No. 886,209

Int. Cl.[5] B65H *77/00*

U.S. Cl. 318—7 3 Claims

1. A web handling apparatus having a wound roll carried for surface winding by a pair of aligned driven rolls having a variable speed differential between them comprising:

an electric motor driving a first roll of said pair of driven rolls;

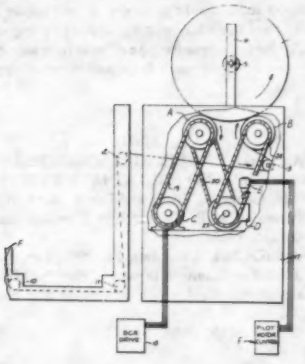
mechanical power transmission means driven by said first roll;

a pilot delivering a torque to said power transmission *means* opposite to that of the first roll to reduce the output thereof to control the output of the power transmission *means;*

means controlling the torque delivered by said pilot motor responsive to the tension in the web delivered to the wound roll to reduce the output in proportion to such tension; and

said power transmission means driving a second roll of said pair of driven rolls;

whereby a differential in speed between the first and second rolls is created wherein the speed of the second roll is slightly less than that of the first roll thus producing packing of the web wound by the second roll upon the wound roll by retarding passage of the web thereto.



3. A web handling apparatus having a wound roll carried for surface winding by a pair of aligned driven rolls having a variable speed differential between them comprising:

an electric motor driving a first roll of said pair of driven rolls;

mechanical power transmission means including electrically operable means varying the output of the power transmission means responsive to variations in web tension, driven by said first roll;

means delivering a torque to said power transmission means to vary the output thereof;

means controlling the output of the power transmission means through the electrically operable means; and

said power transmission means driving a second roll of said pair of driven rolls;

whereby a differential in speed between the first and second rolls is created thus producing packing of the web wound upon the wound roll.

Re. 33,400

CIRCUIT BREAKER

Hiroshi Fujii; Hiroaki Fujihisa; Hirotoshi Ohishi, and Yoshiaki Kobayashi, all of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Original No. 4,595,895, dated Jun. 17, 1986, Ser. No. 751,252, Jul. 2, 1985. Application for reissue Jun. 14, 1988, Ser. No. 207,133

Int. Cl.[5] H03J *3/00, 1/04;* **H01H** *9/20*

U.S. Cl. 335—26 **3 Claims**

1. A circuit breaker comprising:

a handle for connection and disconnection of contacts by outside controlling thereof and energized by a spring toward its position of disconnection,

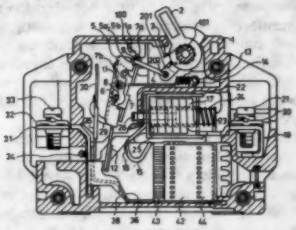
a link member which is linked by its one end to a driving part of said handle, thereby to form a toggle link system together with said handle,

a roller rotatably held on the other end of said link member,

a fixed contact fixed on a part of a case,

a moving contact arm which has a roller receiving indent on one end part and a moving contact on the other end part, is cradlably fulcrumed on the case and is energized in a direction to make said moving contact [touch] *detach from* said fixed contact to make said [connection] *disconnection,*

an engaging lever which has an engaging part disposed to face said roller receiving indent to hold said roller and its cradlably fulcrumed on the case,



an overcurrent trip device which is for releasing said engaging of said roller by said engaging part when an overcurrent above a predetermined value arises, thereby making said moving contact detach from said fixed contact to make said disconnection, and

a roller guide member which is provided in said case to form a roller guiding path together with said roller-receiving-indent for smooth guiding of said roller during its motion from a tripped position where said roller is apart from said roller-receiving-indent to a reset position where said roller is resting on said roller-receiving-indent.

Re. 33,401

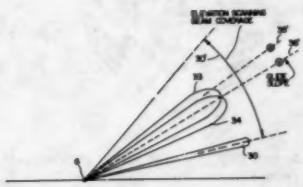
MICROWAVE LANDING SYSTEM

John P. Chisholm, Reno, Nev., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Original No. 4,635,064, dated Jan. 6, 1987, Ser. No. 719,849, Apr. 4, 1985. Application for reissue Dec. 19, 1988, Ser. No. 286,721

Int. Cl.[5] G01S *1/16*

U.S. Cl. 342—408 **49 Claims**



1. The method of providing MLS aircraft landing guidance and independently monitoring the accuracy of that MLS guidance for a prescribed approach path by transmitting from ground based antenna means in a repeating sequence of allocated MLS time intervals plural diverse guidance functions respectively including scanning beam precision landing guidance functions interspersed with fixed-beam precision guidance functions, including the steps of:

(a) scanning said scanning beam in first and second opposed directions across an approach region including the prescribed approach path to provide said scanning beam function, the scanning beam being transmitted within its

own allocated MLS time intervals in the sequence and starting and stopping on opposite sides of the prescribed approach path;

(b) transmitting during non-interfering MLS time intervals fixed-beam guidance beams paired along opposite sides of the prescribed approach path such that the radiation patterns of the paired beams overlap the prescribed approach path by the same amount to provide said fixed beam function, whereby their intensities as measured along the prescribed approach path are mutually equal;

(c) receiving in an approaching aircraft said transmitted guidance beams to provide received signals;

(d) processing the signals received from the scanning beam guidance function to provide a first output signal which varies in proportion to the time between the reception in the aircraft of the scanning beam passing in said first direction and the reception of the scanning beam passing in the second direction at the present location of the aircraft, and using such first output signals to generate scanning beam guidance signals with respect to the prescribed approach path;

(e) processing the signals received from the paired fixed-beam guidance function by comparing their relative amplitudes to provide a second output signal which varies in proportion to the relative strengths thereof as received at the present location of the aircraft, and using such second output signals to generate fixed beam guidance signals with respect to the prescribed approach path; and

(f) comparing said first output signals and said second output signals, and providing for aircraft guidance said scanning beam guidance signals when the first and second output signals substantially agree.

Re. 33,402

PROTECTIVE CARRYING CASE FOR VIDEO CASSETTE APPARATUS AND METHOD OF ENCLOSING THEREOF

Ted K. Thrush, Phoenix, Ariz., assignor to Portavideo International, Inc., Tempe, Ariz.

Original No. 4,669,001, dated May 26, 1987, Ser. No. 552,159, Nov. 15, 1983. Continuation-in-part of Ser. No. 530,897, Sep. 12, 1983, Pat. No. Des. 281,200. Application for reissue Jan. 10, 1989, Ser. No. 295,655

Int. Cl.[5] **B65D** *85/00, 85/30;* **H04N** *5/782*

U.S. Cl. 360—33.1 **13 Claims**

1. A protective carrying case for an enclosed video cassette apparatus, comprising:

upper and lower carrying case halves, said video cassette apparatus positioned within said carrying case halves;

means for securing said upper carrying case half to said lower carrying case half at a plurality of peripheral points thereof;

first access means located on an exterior portion of one of said upper and lower carrying case halves for affording quick access to a cassette door of said video cassette apparatus and to permit rapid loading and unloading of a video cassette therethrough and into and out of said enclosed video cassette apparatus;

second access means for additionally affording access to electrical connections of said video cassette apparatus;

control panel access means for allowing access to at least a portion of the video cassette apparatus' controls, said control panel access means is substantially integral to a front portion of said carrying case;

at least one of first feet support means coupled to a first side portion of said upper carrying case half and at least one of second feet support means coupled to a first side portion of said lower carrying case half for providing support and stability to said carrying case when said carrying case is rested on said first and second feet support means, said first feet support means are substantially proximate to said second feet support means when said upper and lower carrying case halves are connected together;

at least one set of ventilation port means located in at least one of said upper and lower carrying case halves for permitting circulation of cooling air for said video cassette apparatus located therein; and

handle means for allowing hand gripping of said carrying case and for also providing a locking together of said upper and lower carrying case halves, said handle means coupled to second side portions of said upper and lower carrying case halves which second side portions are substantially on the opposite side of said first side portions to which are coupled said first and second feet support means.

Re. 33,403

METHOD FOR TREATING DISORDERS OF THE VASCULAR AND PULMONARY SYSTEMS

Ralph J. Stolle, Oregonia, Ohio, and Lee R. Beck, Birmingham, Ala., assignors to Stolle Research & Development Corporation, Cincinnati, Ohio

Original No. 4,636,384, dated Jan. 13, 1987, Ser. No. 546,162, Oct. 27, 1983. Continuation-in-part of Ser. No. 384,625, Jun. 3, 1982, abandoned. Application for reissue Jan. 13, 1989, Ser. No. 296,969

Int. Cl.[5] **A61K** *39/40, 39/42, 39/395, 35/20*

U.S. Cl. 424—87 **26 Claims**

14. A method of lowering lipid blood stream levels in an animal which comprises administering to said animal, in an amount and for a time sufficient to produce said lowering effect, milk collected from a bovid being maintained in a hyperimmune state against bacterial, viral or cellular antigens or a mixture of two or more of said antigens.

Re. 33,404

ENHANCED DISTANCE DATA TRANSMISSION SYSTEM

James H. Milligan, Shoreview, Minn., assignor to Megabit Communications, Inc., Little Canada, Minn.

Original No. 4,642,629, dated Feb. 10, 1987, Ser. No. 596,858, Apr. 9, 1984. Continuation-in-part of Ser. No. 486,427, Apr. 18, 1983, abandoned. Application for reissue Jan. 27, 1989, Ser. No. 303,631

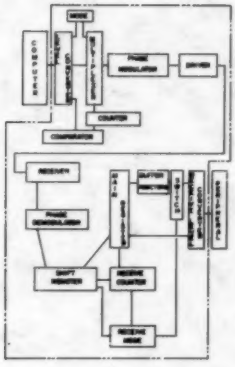
Int. Cl.[5] **H04Q** *1/00*

U.S. Cl. 340—825 **34 Claims**

21. A logic system for transferring digital data between parallel channel digital data external devices, said logic system having a first end equipped with an incoming parallel channel and outgoing parallel channel interfaced with a first said parallel channel external device, and a second end equipped with an incoming parallel channel and outgoing parallel channel interfaced with a second said parallel channel external device, each said end of said logic system being equipped with a serialization means for serializing into serial form bytes of parallel channel digital data signals incoming to said logic system, a transmission means for transmitting the serial form of incoming parallel digital data signals to the other end of said logic system, and a converting means for converting serial form digital data signals transmitted thereto from the other end of said logic system into parallel form, said logic system being further characterized by the fact that it consists of said first and second ends opposite each other and transmission media

linking said ends together, and by the fact that features of said first end include:

mode setting means for establishing the digital data message handling mode for said entire logic system, there being at least a first and second said message handling mode for said entire logic system, said first mode being a random message handling mode and said second mode being a WRITE message handling mode, and



facilitating means selectively operable within the first end for generating within said first end a return signal or signals from a portion of the parallel channel digital data signals incoming from the first external device and for returning said return signal or signals back to said first external device to facilitate further output of parallel channel digital data signals by said first external device, said facilitating means being inoperable under said first message handling mode but effectively placed in operation under at least said second message handling mode.

Re. 33,405

PURIFIED HUMAN PROSTATE ANTIGEN

Tsann M. Chu; Ming C. Wang, both of Williamsville, and Lawrence Papsidero, Lakawanna, all of N.Y., assignors to Research Corporation Technologies, Inc., Tuscon, Ariz.

Original No. 4,446,122, dated May 1, 1984, Ser. No. 316,954, Dec. 23, 1980. Continuation-in-part of Ser. No. 108,217, Dec. 28, 1979, abandoned. Application for reissue Oct. 4, 1988, Ser. No. 254,015

Int. Cl.[5] **G01N** *33/536;* **C12P** *21/08;* **C07K** *15/28, 15/06*

U.S. Cl. 530—350 **32 Claims**

18. A method for diagnosing carcinoma of the prostate, which comprises:

(a) contacting a body fluid selected from the group consisting of blood, a blood fraction, and urine of a human being with immunoprecipitating antibodies to an antigen consisting essentially of the human prostate specific antigen of claim 1 associated with both normal and cancerous prostatic tissue which is distinct from prostatic acid phosphatase, said antibodies being free of cross-reactivity against prostatic acid phosphatases and against antigens associated with other carcinomas to form an immunoprecipitin complex between said antibodies and said antigen; and

(b) detecting the presence of said complex.

PLANT PATENTS

GRANTED OCTOBER 23, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,361
ROSE PLANT — MEISELGRA VARIETY

Alain A. Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Sep. 13, 1989, Ser. No. 406,600
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of Miniature rose plant characterized by the following combination of characteristics:

(a) forms in abundance on a continuous basis attractive double long lasting blossoms which are bengal rose in coloration,
(b) forms fairly vigorous vegetation,
(c) exhibits a compact and bushy growth habit,
(d) is well adapted to greenhouse forcing and to the low light and low humidity growing conditions commonly encountered in the home, and
(e) is not particularly affected by crytogamic diseases;

substantially as herein shown and described.

7,362
HYBRID TEA ROSE PLANT NAMED RUIDRIKO

Gijsbert de Ruiter, Hazerswoude, Netherlands, assignor to de Ruiter's Nieuwe Rozen B.V., Hazerswoude, Netherlands

Filed Aug. 11, 1989, Ser. No. 392,566
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea rose class, substantially as shown and described, characterized particularly by a plant suitable for growing under glass and which produces long lasting attractive light pink flowers.

7,363
ROME BEAUTY APPLE—"TIFT SPUR ROME #21"

Calvin L. Cooper, Brewster, Wash., assignor to Paul G. Tift, Brewster, Wash., a part interest

Filed May 31, 1988, Ser. No. 200,576
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of Rome Beauty apple tree, substantially as herein shown and described, characterized particularly by the tendency for a high percentage of leaf axillary buds to develop into spurs and/or shoots; the tendency for the purse to become enlarged during the time the fruit is on the spurs; the tendency to bear uniformly large fruit; and the tendency to bear fruit of higher red color factor and covering a higher percentage of the fruit surface than is characteristic of conventional Rome Beauty Apples.

7,364
NECTARINE TREE "SUN BURST"

Cedric J. Riano, 9905 Avenue 404, Dinuba, Calif. 93618

Filed Apr. 7, 1989, Ser. No. 334,574
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree substantially as illustrated and described and which is somewhat remotely similar to the Sun Grand Nectarine Tree (U.S. Plant Pat. No. 974) with which it is most closely similar but which is distinguished therefrom and characterized principally as to novelty by producing fruit which are mature for commercial harvesting and shipment approximately August 10 through August 20 in the San Joaquin Valley of Central California and which further has noteworthy shipping and handling characteristics

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7,365
LILY PLANT NAMED 'MENTON'

Floris Vletter, Rijnsburg, Netherlands, assignor to Gebr. Vletter & J. H. Den Haan, Netherlands

Filed Apr. 7, 1989, Ser. No. 334,486
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of lily plant named Menton, as illustrated and described.

7,366
AFRICAN VIOLET PLANT NAMED 'IMPROVED HOUSTON'

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,527
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Improved Houston, as described and illustrated, and particularly characterized by its single, deep blue flowers; strong, upright flower stems that curve toward the center to form a compact bouquet above the leaves, medium green serrated girl-type leaves, profuse flowering, vigorous growth habit, flowering 10–11 weeks after potting, and its long lasting and non-dropping flowers.

7,367
CACTACEAE PLANT NAMED DASHER

Harry Higaki, Hillsborough, Calif., assignor to Bay City Flower Co., Half Moon Bay, Calif.

Filed Apr. 19, 1989, Ser. No. 340,562
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. The new and distinct hybrid plant variety of the Cactaceae family substantially as herein shown and described.

PATENTS

GRANTED OCT. 23, 1990

ERRATA

For CLASS	See PATENT NO.
081-064	4,964,330
132-074	4,964,372
606-060	4,964,403
137-171	4,964,420
137-460	4,964,421
137-512	4,964,422
137-543	4,964,423
137-557	4,964,424
437-001	4,964,437
181-146	4,964,482
192-012	4,964,503
192-048	4,964,504
192-053	4,964,505
192-106	4,964,506
267-140	4,964,516
433-214	4,964,769
433-223	4,964,770
604-192	4,964,866
055-337	4,964,898
055-356	4,964,899
055-387	4,964,900
062-013	4,964,901
065-071	4,964,902
065-275	4,964,903
261-130	4,964,977
264-119	4,964,978
430-292	4,965,073
428-194	4,965,097
428-203	4,965,098
502-304	4,965,243
525-415	4,965,300
546-134	4,965,364
392-407	4,965,434
362-249	4,965,457
364-419	4,965,458
379-189	4,965,459
354-212	4,965,600
354-063	4,965,601
342-372	4,965,602
342-372	4,965,603

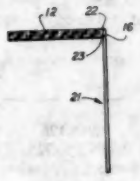
342-374 4,965,604
343-700 4,965,605
343-703 4,965,606
343-861 4,965,607
375-007 4,965,641
362-032 4,965,701
364-900 4,965,771
364-900 4,965,772
380-021 4,965,804
373-036 4,965,812
373-002 4,965,813
382-001 4,965,829
200-038 4,965,859
219-113 4,965,860
250-385 4,965,861
250-453 4,965,862
307-450 4,965,863
318-135 4,965,864
324-158 4,965,865
333-164 4,965,866
341-143 4,965,867
343-756 4,965,868
343-781 4,965,869
355-068 4,965,870
355-055 4,965,871
357-035 4,965,872
360-041 4,965,873
360-070 4,965,874
362-217 4,965,875
362-247 4,965,876
363-146 4,965,877
364-424 4,965,878
364-424 4,965,879
364-468 4,965,880
380-050 4,965,881
364-513 4,965,882
371-052 4,965,883
375-106 4,965,884
378-168 4,965,885

PATENTS

GRANTED OCTOBER 23, 1990

GENERAL AND MECHANICAL

4,964,171
PROTECTIVE SHIELD AND VISOR
Timothy J. Landis, 2006 McLaren Dr., Roseville, Calif. 95661-4945
Continuation-in-part of Ser. No. 194,150, May 16, 1988. This application May 19, 1989, Ser. No. 354,345
Int. Cl.[5] A61F 9/00
U.S. Cl. 2—9 **2 Claims**



1. A two-piece, disposable mask comprising a visor of a rubber-like material having a substantially horizontal, forward extending bill having upper and lower surfaces terminating in a substantially vertical front edge when in place on the head of the wearer, said front edge having substantial thickness, first attachment means for attaching said visor to the head of a wearer, and

a substantially vertical shield formed of a flexible transparent plastic having an inner surface and an outer surface, an upper edge, said shield extending downward to protect the face of the wearer, and

second attachment means for permanently fixing said inner surface of said shield to the thickness of said front edge of said bill with said upper edge vicinal the upper surface of said bill and extending around said front edge,

said front edge being curved approximately parallel to the forehead of the wearer of said shield curving about said front edge around the sides of the face of the wearer, said second attachment means permanently adhering said shield directly to said front edge, said shield extending around the sides of the face of the wearer and covering the eyes, nose and mouth of the wearer.

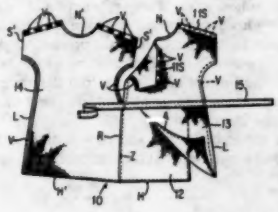
4,964,172
NURSING BLANKET
Jill W. Bollard, 945 Musket Dr., Lansdale, Pa. 19446
Filed Jun. 15, 1989, Ser. No. 366,611
Int. Cl.[5] A41D 1/20
U.S. Cl. 2—104 **5 Claims**

1. A nursing blanket to be used by a nursing mother to screen her breast as well as the head of the feeding infant from public view comprising:

a cloth member having a first portion having one surface thereof disposed toward the mother and configured to drape over and cover the breast of the mother, the arm cradling the infant and the infant's head and a second portion capable of covering the mother's side and portions of her back while the infant is cradled in the mother's arm and in position for nursing; and

means for releasably retaining said cloth member to said arm to maintain the member in the draped position said means disposed entirely on said one surface thereby obstructing the viewing of the breast from all aspects and screening her breast from the public eye thus affording privacy to the mother while nursing.

4,964,173
DIGNITY GOWNS
David G. Gordon, 113 Laredo Ave., New Lebanon, Ohio 45345, and Carol A. Winkler, 8722 Dayton-Oxford, Franklin, Ohio 45005
Filed Jun. 14, 1989, Ser. No. 366,649
Int. Cl.[5] A41B 9/00; A41D 10/00
U.S. Cl. 2—114 **10 Claims**



1. A dignity gown which provides total coverage of a trunk and torso of a patient while in a hospital, convalescent center, medical treatment facility and the like although remaining functional for nursing and medical procedures to be performed as to body portions of a patient as may be needed, comprising:

an openable front of the gown consisting of in essence a top front portion as well as overlapping lower front flap panel portions as well as a band permanently joined to the front top and bottom portions transversely at an intermediate location thereof;

a completely closed back portion unitary from top to bottom and secured along one side thereof in a predetermined fastening to at least one of said lower front panel portions; and

fastening means along sleeve and shoulder areas of front and back portions as well as along a side opposite to that joined to said at least one of said lower front panel portions, said fastening means permitting partial removal and at least in part folding open of the top front portion if necessary independently of the lower front portion so that a patient only needs to expose a minimum of half of the chest area for examination as opposed to the entire or whole body exposure previously encountered as well as exposure of the complete chest area for examination while the bottom front portion of the trunk and torso of the body of a patient can be kept covered and vice versa as may be needed for examination and treatment of the patient in a medical facility; and

said lower front portion being also removable and at least in part foldable open during examination and medical treat-

ment by folding open thereof and detachment of the fastening means as to each other.

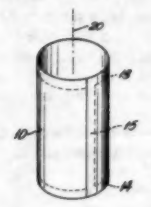
4,964,174
GLOVES FOR MECHANICS
Linda M. Martin, 3H Research Rd., Greenbelt, Md. 20770
Filed Jan. 31, 1989, Ser. No. 304,180
Int. Cl.[5] A41D *19/00*
U.S. Cl. 2—161 R **6 Claims**

1. A protective glove pair, comprising:
an outer glove and an inner glove within said outer glove, wherein said inner and outer gloves are substantially mutually attached to each other, wherein
said outer glove comprises a glove body and protective finger and thumb portions, said protective portions comprising open-ended tubes from the glove body to cover each of the fingers and thumb to a distance between the metacarpophalangeal joints and the distal knuckle of each finger and thumb, and
said inner glove is flexible and tight fitting to the hand and comprises a natural or synthetic rubber or synthetic polymer.

4,964,175
HAIR PROTECTING DEVICE
Mary W. Taylor, 1605-1 Kent Dr., Wilson, N.C. 27893
Filed Jun. 29, 1989, Ser. No. 372,755
Int. Cl.[5] A41D *23/00*
U.S. Cl. 2—171 **7 Claims**

1. A hair-protecting adapted to be worn upon the head of a person, comprising:
an elongate flex fabric body including a generally cup-shaped rear section, first and second side sections connected to and extending from opposite sides of said rear section, and first and second strap-like sections connected to and extending from respective ones of said side sections;
said body having upon at least said rear and side sections thereof an inner-ply fabric of smooth satin-like construction resistent to entanglement with hair engaged thereby;
each of said strap-like sections of said body having a flexible band of fastener material of the hook/loop type secured thereto adjacent the free end thereof;
complementary fastener material of the loop/hook type upon the outer surface of said rear section of said body, said rear and side sections of said body having an upper edge and said complementary fastener material being spaced sufficiently below said upper edge as to permit a flap-like portion of said body which normally projects above said complementary fastener material to be folded rearwardly and downwardly over said complementary fastener material;
said rear section of said body being adapted to overlie the rear of the head of the person wearing said device, and said side sections of said device being adapted to overlie respective opposite sides of the head of said person;
each of said strap-like sections extending during use of said device from the thereto connected one of said side sections about the front, a side and part of the rear of the head of said person, and said band of fastener material thereon being in engaged relationship with said complementary fastener material upon said outer surface of said rear section of said body.

4,964,176
LEG RAIN PROTECTOR
Robert Previdi, 30 La Farge La., Manhasset, N.Y. 11030
Filed Feb. 2, 1990, Ser. No. 474,502
Int. Cl.[5] A41D *27/12, 17/00*
U.S. Cl. 2—242 **4 Claims**



1. A protection device to protect the lower trouser leg portions from becoming wet in precipitation, comprising two fexible sheets;
each sheet comprising a rectangular sheet having inner and outer faces, an adhesive band means adhered to said inner face along four edges thereof and adherable to said outer face and to textile material;
a flexible protective strip means covering said adhesive band to be removed from the adhesive band means when the sheet is used, wrapping the sheet around the lower trouser leg portion.

4,964,177
BUSTDART-FREE TAILORING PROCESS FOR A FITTED-WAIST DRESS TO ELIMINATE CUTTING OF ITS BACKPIECE
Ding S. Huang, No. 9-16, Lane 344, Nanking W. Rd., Taipei, Taiwan
Filed Aug. 3, 1988, Ser. No. 227,724
Int. Cl.[5] A41D *27/00*; A41H *3/00*
U.S. Cl. 2—243 B **2 Claims**

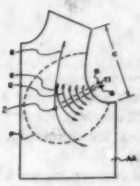
1. A bustdart-free tailoring process for a fitted-waist dress from a pattern including a front piece (A) having a bust-dart opening defining therebetween an upper half piece and a lower half piece of said pattern and a back piece pattern, (B), the front piece (A) and the back piece (B) each being formed with an armpit defining two extremities, said dress being made of a woven cloth having warp and weft yarns, and designed so as to eliminate cutting of the back piece (B), which comprises the steps of:
preparing the front piece pattern (A) having the armpit

extremities, said pattern (A) having a wedge shaped bust dart opening with an apex bust point (2),

drawing a straight line (10) from said bust point (2) to an armpit point (11) on said front piece (A) and located between said extremities,

cutting the straight line (10) so as to define a cutting line on said pattern,

pivoting said upper half piece around said bust point (2) so as to close said bust-dart opening, merging said upper half and said lower half-piece, widening said initial cutting line to form a gap, widening the distance (C) defined between said two extremities of the armpit on said front piece (A) to a distance (D), placing said pattern (A) on said woven cloth, thereby obtaining a tailored front piece (AA), outlining on said tailored front piece (AA) of the fabric an area (F) of approximately truncated oval shape, taking said bust point (2) as the center of said oval shape, one radius thereof almost bordering the vertical edge of said tailored front piece (AA), the longer axis of said truncated oval shape intersecting the curved armpit line between said extremities;



warming and wetting said truncated oval area (F) so as to make the warp yarns and weft yarns of said woven cloth more flexible for subsequent re-alignment;

defining bilateral part-circular paths along directions (E) along a portion of said truncated oval area (F) between said bust point (2) and said armpit extremities, regarding said armpit point (11) as a curvature centroid;

gathering the pile and weft yarns towards said armpit point (11) by pressing bilaterally with respect to said cutting line (10) along said part-circular paths along directions (E) within said truncated oval area (F) and subjecting said truncated oval area (F) to a heating treatment,

proceeding with a one-way stretched ironing and pressing procedure from said bust point (2) to said armpit point (11) along directions (G) approximately parallel with said initial cutting line (10),

repeating said stretched ironing and pressing procedure until said distance (D) shrinks to said distance (C),

placing a false crease (3) along said armpit line so as to permanently secure said distance (C), thereby obtaining a completely tailored front piece of the garment.

4,964,178

SAFETY HELMET FOR MOTOR-CYCLISTS PROVIDED WITH MANUALLY-ADJUSTABLE VENTILATION MEANS

Gazia Giancarlo, Rome, and Nocchi Marzio, Mozzo, both of Italy, assignors to Nolan S.p.A., Mozzo, Italy

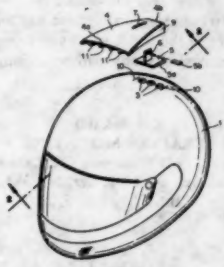
Filed Nov. 21, 1988, Ser. No. 274,378

Claims priority, application Italy, Dec. 15, 1987, 22994 A/87

Int. Cl.[5] A42B *3/02;* **A42C** *5/04*

U.S. Cl. 2—414 **8 Claims**

1. Safety helmet equipped with internal channels for the ventilation and the cooling of the internal area, characterized in that said helmet is provided at the top of its external rigid cap, with at least one opening or air intake, in communication with said air channels and provided in the cap and through the underlying protective layers, above which an aerodynamic guide fin is positioned at a short distance from the external surface of the cap, which is so shaped as to create, between the cap and the guide fin, a duct having a cross-section with a surface area decreasing towards the rear portion of the helmet, capable of enabling an air stream flowing through said duct to locally undergo, in correspondence of said air intake, a speed increase, with a such a decrease in the local pressure as to determine a suction of warm air from the interior of the helmet, with said warm air flowing towards the outside through the



outlet of said air intake, with between said guide fin and the external surface of said cap an adjustment element of slider type being provided, guided on said guide fin, and manually adjustable in correspondence of said air intake, with said slider being so shaped and positioned as to constitute, besides a flow shutter, also a baffle plate, capable of favouring the intake of warm air from the interior of the helmet.

4,964,179

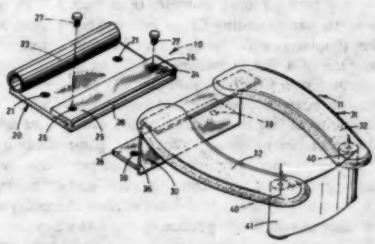
TOILET SEAT FOR DISABLED PERSONS

Robert H. Kimes, Hickory Hill Box 33, Freeport, Ill. 60132

Filed Sep. 14, 1989, Ser. No. 407,109

Int. Cl.[5] A47K *13/00*

U.S. Cl. 4—239 **4 Claims**



1. For use with a conventional toilet having a base supporting a water receptive toilet bowl bordered by an upper rim, a toilet seat structure for converting the toilet to use by a disabled person, comprising:

a seat assembly comprising a stationary toilet seat,

a unitary elevating support attached to a forward end of said seat and extending vertically therebeneath to a downward facing surface which rests freely on top of the upper rim of the toilet bowl and is the sole support for said forward end;

a substantially z-shaped attachment bracket connected to a rearward end of said toilet seat comprising a leg extending vertically downwardly from the underside of said seat and having a lower end thereof adapted to rest atop said rim including connector means projecting horizontally from said leg adjacent said lower end thereof;

said leg and elevating support cooperating to support and maintain said toilet seat in horizontal position elevated over said rim of said bowl;

a mounting assembly comprising a planar plate adapted to be attached to the base of the toilet rearwardly adjacent said bowl,

and connective means fixed to said plate including means opposing said attachment bracket for inserted reception of said connector means whereby to anchor said seat assembly in stationary position on the toilet;

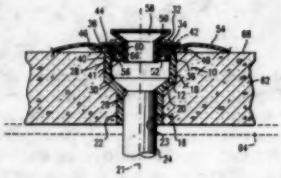
the elevation of said seat above said rim providing an open spacing therebetween of sufficient size and extent to permit the entry of the hand, wrist and forearm as necessary to effect perineal cleaning without raising from said seat.

4,964,180

SHOWER STRAINER MOUNTING ASSEMBLY

Gerold J. Harbeke, 2443 Waterside Cr., Lakeworth, Fla. 33461

Filed Jul. 24, 1989, Ser. No. 383,585
Int. Cl.[5] E03C *1/26*
U.S. Cl. 4—288 **7 Claims**



1. A shower strainer mounting assembly comprising:

an elongated cast-in adaptor coupling for being cast into concrete, said elongated coupling adaptor having a length of at least around 4 inches, a lower end portion of said elongated coupling having a circular cross section with an inner diameter of a size for tightly receiving a standard 2 inch pipe and a top end portion having a circular cross section with an inner diameter of at least 3 5/16 inches;

a separate pan-mounting flange member comprising a circular tubular portion having a continuous round external surface of a size and shape for fitting snugly, about the circumference thereof, into the top end portion of said cast-in adaptor coupling and an internal surface with a diameter of less than 3 5/16 inches but at least around 2 11/16 inches in cross section, said pan-mounting flange member further comprising a flange portion attached to an upper end of said tubular portion and extending radially outwardly from said outer surface thereof, an upper surface of said flange portion facing away from said tubular portion being substantially flat, said pan-mounting flange member defining female threaded holes for receiving bolts, said holes extending parallel to the axis of said tubular portion through said flange into said tubular portion, said holes being located with centers approximately on a 3½ inch circle concentric with said circular tubular portion and being positioned substantially radially inwardly spaced from said external surface of said tubular portion;

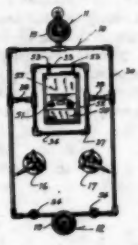
whereby said cast-in adaptor coupling is mounted to a concrete form and cast into a concrete floor, after curing of said concrete said lower end portion of said cast-in adaptor coupling receives a standard 2 inch pipe and is adhered thereto, said tubular portion of said pan-mounting flange member can be inserted into, and adhered to, the top end of said cast-in adaptor coupling, and a shower pan can be placed on the upper surface of said flange portion, a standard shower strainer clamp can be fastened to said pan-mounting flange member by means of bolts engaged in said female threaded holes, and a shower strainer can be screwed into said shower strainer clamp

4,964,181

COMBINED SHOWER HEAD AND WATERPROOF TAPE DECK

Mayer Alpert, Sheboygan, Wis., assignor to M. A. Industries Ltd., Sheboygan, Wis.

Filed May 31, 1988, Ser. No. 200,229
Int. Cl.[5] A47K *3/22*
U.S. Cl. 4—597 **4 Claims**



1. A shower unit comprising;

at least one adjustable shower head and waterproof means located in said shower unit for reproducing prerecorded audible instructions for different types of hydrotherapy for personal usage;

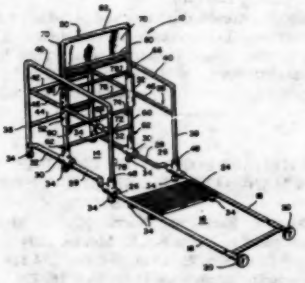
water supply means comprising variable volume hot water and variable volume cold water supply means, said showerhead being connected to receive said water from said water supply means, at least one said shower head being adjustable to deliver a pulsed spray of water to selected locations of the user's body, while said means for reproducing audible instructions located in said shower unit is operating.

4,964,182

TRANSFER AID WITH AUXILIARY SUPPORT SYSTEM

Joseph Schmerler, 140 Devon Rd., Tenafly, N.J. 07670

Continuation-in-part of Ser. No. 304,467, Feb. 1, 1989, Pat. No. 4,894,871. This application Jan. 22, 1990, Ser. No. 468,366
Int. Cl.[5] A61G *7/10*
U.S. Cl. 5—81 R **11 Claims**



1. A transfer aid for assisting weight transfer of a user between a seated and a standing position comprising a space frame having a front section which includes a center frame, said center frame being pivotally mounted to the front section, locking means for releasably securing the center frame in a substantially vertical operational mode, said center frame further including at least one assist bar adapted for hand reachable grasp by the seated user to initiate a pivotal movement from a seated to a standing position, said center frame further being

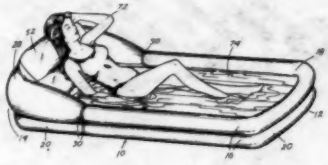
releasable from the locking means for rotational displacement to a substantially horizontal operational mode for providing an auxiliary support surface.

4,964,183

TANNING TUB

James W. LaForce, Jr., c/o TAN-N-TUB, P.O. Box 6100, Chico, Calif. 95927

Continuation of Ser. No. 107,542, Oct. 13, 1987, abandoned. This application Oct. 18, 1988, Ser. No. 262,167
Int. Cl.[5] A47C 27/10
U.S. Cl. 5—421 2 Claims



1. An inflatable portable tub-like receptacle for use as a water proof container arranged for sunbathing, comprising:

a substantially rectangular air mattress made of pliable vinyl and comprising a plurality of longitudinally aligned infatable tubes with said tubes having intercommunicating air passages at the tube ends, said tubes being fabricated of clear plastic material on an upper side and reflective plastic material on an a lower side, said air mattress being formed by continuous welds along both sides of said tubes and along a set of extending edges of said mattress, said receptacle further comprising a pair of stacked tube members exterior of said mattress, said stacked tube members arranged to inflate and deflate simultaneously with inflation and deflation of said mattress, said extending edges of said mattress being affixed between said stacked tubes to form said water proof container when inflated, said clear upper side of said mattress tubes providing a supporting surface for a user said air mattress, said air mattress being suspended centrally between said stacked tube members with the lower of said stacked tube wall members being a supporting base for said mattress and the upper of said stacked tube members forming a containment wall surrounding said mattress, said containment wall being gradually enlarged towards and around one end of said mattress forming an enlarged end therefor.

4,964,184

FITTED TOP AND BOTTOM BEDSHEET COMBINATION

Doris Lewis, 73 Gamewell La., Willingboro, N.J. 08046

Continuation-in-part of Ser. No. 86,984, Aug. 19, 1987, abandoned, and a continuation-in-part of Ser. No. 328,373, Mar. 24, 1989, abandoned. This application Jun. 22, 1989, Ser. No. 370,318
Int. Cl.[5] A47G 9/02
U.S. Cl. 5—496 24 Claims

1. A fitted top and bottom bedsheet combination usable extending about a mattress on a bed comprising:

(a) a bottom bedsheet means adapted to extend generally about the mattress including:

(1) a bottom main section extending generally horizontally covering substantially all of the upper surface of the mattress;

(2) a first lateral bottom section extending generally downwardly from and attached with respect to one lateral side of said bottom main section to substantially cover one lateral side of the mattress therealong;

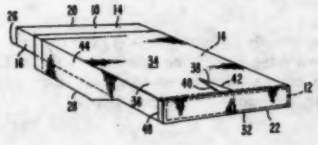
(3) a second lateral bottom section extending generally downwardly from and attached with respect to the other lateral side of said bottom main section to substantially cover the other lateral side of the mattress therealong;

(4) a head bottom section extending generally downwardly from and attached with respect to the head end of said bottom main section to substantially cover the head end of the mattress therealong;

(5) a foot bottom section extending generally downwardly from and attached with respect to the foot end of said bottom main section to substantially cover the foot end of the mattress therealong;

(6) a mattress securement means along at least a portion of the lowermost edge of said first lateral bottom section, said second lateral bottom section, said head bottom section and said foot bottom section to retain said bottom bedsheet means with respect to the mattress of the bed;

(b) a top bedsheet means adapted to extend at least partially



over said bottom main section of said bottom bedsheet means, said top bedsheet means including:

(1) a top main section detachably secured directly to said bottom main section immediately adjacent said bottom foot section, said top main section extending substantially horizontally over said bottom main section, said top main section including a gathering means adjacent said foot bottom section;

(2) a first lateral top section extending downwardly from said top main section to extend over said first lateral bottom section, said first lateral top section including a first lower edge extending downwardly from said top main section adjacent said foot bottom section; and

(3) a second lateral top section extending downwardly from said top main section to extend over said second lateral bottom section, said second lateral top section including a second lower edge extending downwardly from said top main section adjacent said foot bottom section.

4,964,185

CHEMICAL SOLUTION DISPENSER APPARATUS AND METHOD OF USING

Chris F. Lehn, Minneapolis, Minn., assignor to Ecolab Inc., St. Paul, Minn.

Division of Ser. No. 817,350, Jan. 9, 1986, Pat. No. 4,858,449. This application Nov. 18, 1988, Ser. No. 273,797
Int. Cl.[5] D06F 39/02
U.S. Cl. 8—158 10 Claims

1. A method for dispensing a predetermined quantity of a chemical in a solution of unknown or variable concentration into a utilization vehicle, the solution having a level of conductivity, comprising the steps of:

(a) dispensing the chemical solution into the utilization vehicle at a known constant rate of flow;

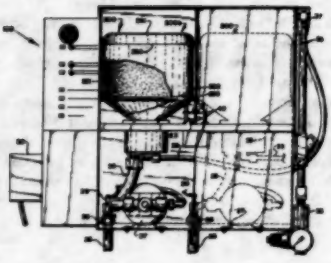
(b) measuring the conductivity of the solution as the solution flows into the utilization vehicle;

(c) calculating the amount of chemical dispensed into the utilization vehicle by:

(i) calculating a periodic amount of chemical dispensed into the utilization vehicle after a predetermined time interval based upon the constant solution flow rate, the

length of the time interval and the conductivity of the solution; and

(ii) summing the periodic amounts to obtain a total amount of chemical dispensed and comparing the total amount to a predetermined amount of chemical to be dispensed;



(d) periodically repeating steps (b) and (c); and

(e) terminating flow of the solution into the utilization vehicle when said predetermined amount of chemical has been dispensed into the utilization vehicle.

4,964,186

FLOOR MOP HEAD HAVING REMOVABLE SCUFF PAD

John E. Stuck, Independence, Mo., assignor to United Floorcare Systems, Inc., Independence, Mo.

Filed Jul. 18, 1989, Ser. No. 360,878
Int. Cl.[5] A47L *13/12, 13/20*
U.S. Cl. 15—118 23 Claims

1. A mop head for use with a cleaning pad formed at least partially of fibrous material, the mop head comprising:

a plurality of lengths of string material;

banding means for fastening the plurality of lengths of string material together; and

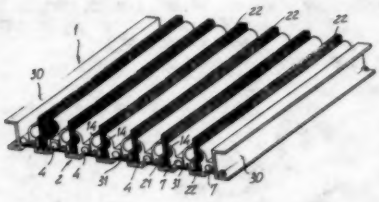
at least one strip of pad fastening material having a plurality of resilient hooks formed therein adapted to engage the fibrous material of the cleaning pad so as to fasten the cleaning pad on the mop head.

4,964,187

MODULAR ELEMENT DOOR MAT

Gianni Dell'Orto, Via Bellerini, 60 - 20038 Seregno (Milano), Italy

Filed Jun. 30, 1989, Ser. No. 374,454
Claims priority, application Italy, Jul. 11, 1988, 21321 A/88
Int. Cl.[5] A47L *23/22*
U.S. Cl. 15—161 1 Claim



1. A modular element door mat comprising a plurality of section lengths, each of said lengths comprise:

a body portion having two sides and a centrally located seat portion;

a bristle elements received in said seat portion;

a male coupling element having a loop portion coupled to one side of said body portion and a cylindrical coupling element attached to said loop portion;

a female coupling element attached to the other side of said body portion, said female coupling element comprising a top abutment member adapted to engage a loop portion of an adjacent length to prevent the attached sections from rotating toward the top abutment member but permitting rotation away from said abutment member;

a lower abutment member; and

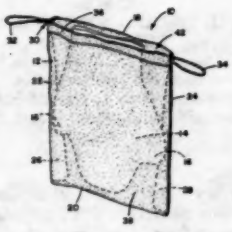
a cylindrical seat adapted to receive a cylindrical male coupling element of an adjacent length, said seat portion having an opening extending through substantially 90 degrees.

4,964,188

CLEAN UP DEVICE

Mary L. Olson, 1147 Ivyhill Dr., Mendota Heights, Minn. 55118

Filed Jul. 6, 1989, Ser. No. 376,415
Int. Cl.[5] A47L *13/18*
U.S. Cl. 15—227 5 Claims



1. A clean up device comprising:

a bag, said bag having a top and a bottom and a first and a second side, said first and second sides each having a pleat longitudinally extending from the top of the bag to the bottom of the bag;

a layer of absorbent material attached to the exterior side of the bag;

a glove being adapted for receiving either a left or right

human hand, said glove being attached to one interior side of said bag; and

a means for closing said bag, said means being located on the top of the bag.

4,964,189

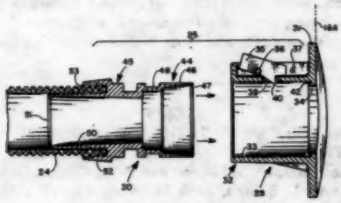
INTAKE SEAL FOR TANK VACUUM CLEANER

Jerome E. Rau, Hoffman Estates; Gary E. Palmer, Roselle, and Grace D. Labrador, Bolingbrook, all of Ill., assignors to Hako Minuteman, Inc., Addison, Ill.

Filed Jan. 12, 1989, Ser. No. 295,884

Int. Cl.[5] A47L 5/36

U.S. Cl. 15—327.2 **4 Claims**



1. In a vacuum cleaner having a tank providing a reservoir for collecting refuse, a motor coupled to said tank for generating a vacuum therein and a hose having a proximal end coupled to said tank and communicating the vacuum in said tank to a distal end for picking up debris and refuse and for routing said debris and refuse to said tank, an improved intake assembly comprising: an adapter mounted on a wall of said tank and including a generally cylindrical wall defining a receptacle having an inlet end and an outlet end, a beveled sealing surface on the interior of said receptacle immediately adjacent the outlet end thereof and extending continuously about said inner wall of said receptacle and spaced inwardly thereof said adapter further including an opening in said wall intermediate said inlet end and said outlet end for receiving a toggle latch mounted to said adapter and received in said opening; and a hose connector having a first end providing a cylindrical seat portion received in said proximal end of said hose for sealing therewith and a second end providing a cylindrical insert adapted for telescopic insertion into said inlet end of said receptacle and defining a leading beveled surface corresponding to and continuously sealingly engaging said sealing surface of said receptacle when said hose connector is assembled to said adapter, whereby a continuous circumferential seal is formed downstream of said opening in said adapter and adjacent the wall of said tank.

4,964,190

FLOOR NOZZLE OF A VACUUM CLEANER

Yoshitaka Murata, Shiga, and Hiroshi Kawakami, Yokaichi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 245,690, Sep. 15, 1988, abandoned. This application Jan. 30, 1990, Ser. No. 476,117

Claims priority, application Japan, Sep. 16, 1987, 62-231315; Sep. 16, 1987, 62-141339[U]

Int. Cl.[5] A47L 9/04

U.S. Cl. 15—369 **17 Claims**

1. A floor nozzle of a vacuum cleaner, comprising:

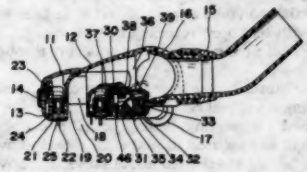
an upper nozzle housing having a portion adapted to be hingedly connected to an intake joint of a vacuum cleaner;

a lower nozzle housing connected to said upper nozzle housing, said lower nozzle housing having an intake opening on a lower side thereof;

a first air passage in said upper and lower nozzle housings and extending between said intake opening and said portion of said upper nozzle housing adapted to be connected to an intake joint of a vacuum cleaner;

a dust collector disposed in said upper and lower nozzle housings, said dust collector having a second air passage therein for communication with said first air passage;

a rotor rotatably mounted in said dust collector and communicating with said second air passage, said rotor comprising a cleaning means for cleaning material from a surface to be cleaned upon rotation of said rotor in one direction, said rotor further comprising means for rotating said rotor



in said one direction and an opposite direction in response to movement of said floor nozzle in a first direction and a second direction, respectively, across a surface to be cleaned;

scraper means in said dust collector for removing material from said cleaning means when said rotor is rotated in said opposite direction by movement of said floor nozzle in said second direction; and

a closure means hingedly connected to said dust collector for opening and closing said second air passage to said first air passage.

4,964,191

CARRIER AND REPLACEABLE CARTRIDGE HANGER ASSEMBLY

James L. Wyatt, Los Angeles, Calif., assignor to Ambassador Industries, Los Angeles, Calif.

Filed Apr. 4, 1988, Ser. No. 177,565

The portion of the term of this patent subsequent to Dec. 24, 2002, has been disclaimed.

Int. Cl.[5] E05D 13/02

U.S. Cl. 16—87.2 **7 Claims**

1. A carrier and a manually insertable snap-in replaceable cartridge hanger assembly for a vertical louver or vane, comprising:

frame means having a top surface, a bottom surface, and a vertical cavity and adapted to slide horizontally along a splined pinion rod;

worm gear means rotatably mounted on said frame means and having a central bore through which the pinion rod is adapted to pass;

a manually insertable snap-in cartridge hanger assembly for mounting in said cavity of said frame means;

said cartridge hanger assembly allowing for quick replacement of a broken cartridge hanger assembly with a new one;

a circular bearing means in said top surface of said frame means for acting as an anchoring point for one end of said snap-in cartridge hanger assembly;

a resilient open retaining clip axially aligned below said circular bearing means and attached to said bottom surface of said frame means for maintaining said snap-in cartridge hanger assembly in proper alignment in said cavity of said frame means;

said manually insertable snap-in replaceable cartridge hanger assembly further comprising:

vertical stem means;

a stem gear having a lower cylindrical journal portion rotatably mounted on said stem means having a vertical axial bore and mating with said worm gear means; said cylindrical journal portion of said stem gear

being axially aligned as part of said stem gear for cooperating with said open retaining clip;

said vertical stem means passing rotatably through said stem gear bore;

securing means on the lower portion of said stem means for holding a vertical blind;

a toothed crown ring having an elliptical shaped radial passage and secured to said stem means above said stem gear, having at least one tooth projecting downward and selectively engageable with a tooth space of said stem gear, said crown of said crown ring cooperating with said circular bearing in said frame means;

said stem means having an enlarged end for stationary securing said toothed crown ring to said stem means.

4,964,192

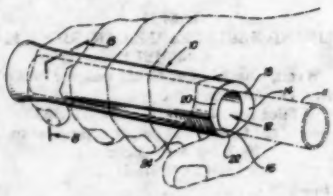
MULTIPLE RADIUS GRIP

Shinji Marui, Kobe, Japan, assignor to Marui, Ltd., Kobe, Japan

Filed Apr. 24, 1989, Ser. No. 342,489

Int. Cl.[5] B62K *23/00*

U.S. Cl. 16—111 R **15 Claims**



1. A grip for cushioning a hard member adapted to be firmly grasped by a human hand, comprising:

a generally tubular-shaped body portion having a cylindrical central opening of size and cross-sectional shape suitable to be slidably mounted onto the hard member in a length direction, the body portion having an asymmetrical cross-sectional shape perpendicular to said length direction and having first, second and third portions each defining a portion of a generally elliptical shape and having a center off-set from the center of the central opening, the outside perimeter of the body portion having a flattened shape on at least one side thereof.

4,964,193

HINGE

Peter R. Rommelfsenger, and Thomas A. Neuwirth, both of Milwaukee, Wis., assignors to E. R. Wagner Manufacturing Company, Milwaukee, Wis.

Filed Apr. 21, 1987, Ser. No. 40,881

Int. Cl.[5] E05D *5/10, 11/08*

U.S. Cl. 16—225 **2 Claims**

1. A hinge comprising,

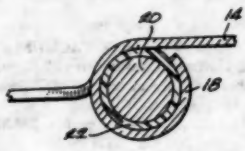
first and second leaves having interengaging formed barrels with aligned apertures through the barrels,

a hinge pin,

a plastic coating bonded on the pin,

said hinge pin being mounted in said apertures and said barrels being crimped onto the hinge pin to engage and radially compress said plastic coating,

said plastic coating having a self-lubricating characteristic



when lightly compressed and gripped by said barrels and developing increasing resistance to hinge operation as the barrels compress and grip said coating with increasing force.

4,964,194

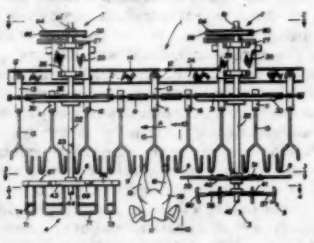
APPARATUS AND METHOD FOR DISJOINTING THE THIGHBONES OF POULTRY CARCASSES

Lawrence J. Kessler, 517 Broad Ave. NW., Canton, Ohio 44708, and Larry I. Bolitho, 8480 Milmonta St. NW., Massillon, Ohio 44646, assignors to L. J. Kessler, Canton; L. I. Bolitho, Massillon and Park Poultry, Inc., Canton, all of, Ohio, part interest to each

Continuation of Ser. No. 342,576, Apr. 24, 1989, abandoned. This application Jan. 17, 1990, Ser. No. 469,750

Int. Cl.[5] A22C *21/00*

U.S. Cl. 17—11 **27 Claims**



1. An apparatus for automatically disjointing the thighbones of poultry carcasses at the proximal end of said bones, said apparatus including:

(a) conveyor means for carrying the poultry carcasses in a certain direction;

(b) rod means synchronized with the conveyor means for disjointing the thighbones;

(c) guide means synchronized with the conveyor means for stabilizing and positioning the poultry carcasses with respect to the rod means; and

(d) means for rotating the rod means and the guide means in opposite directions, so that the rod means disjoints the thighbones of the poultry carcasses as the carcasses are carried past the rod means by the conveyor means.

4,964,195

METALLIC CARD CLOTHING

John D. Hollingsworth, P.O. Box 516, Greenville, S.C. 29602

Filed Nov. 18, 1988, Ser. No. 273,422

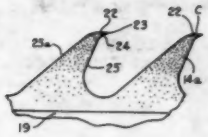
Int. Cl.[5] D01G *15/84*

U.S. Cl. 19—114 **5 Claims**

1. Metallic cord clothing formed from a strip of profile wire comprising:

a plurality of longitudinally aligned teeth punched in said wire;

metal which has been bent over at the tips of respective teeth forming longitudinally extending points;



hardened metal carding surfaces at the ends of the teeth which include the points formed at the tips of respective teeth;

whereby improved carding action is provided.

4,964,196

CLEANING MACHINE FOR TEXTILE FIBRES WITH MEANS FOR REMOVING DUST

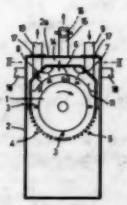
René Schmid, Niederneunforn, and Jürg Koller, Pfyn, both of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Jan. 26, 1990, Ser. No. 470,684

Claims priority, application Switzerland, Jan. 26, 1989, 242/89

Int. Cl.[5] D01G *9/20*

U.S. Cl. 19—200 21 Claims



1. A cleaning machine for textile fibres conveyed in a current of delivery air, the machine comprising a casing, a horizontal roller fitted with beater elements and rotatably mounted in the casing, grate bars located in the casing on the underside of the roller, an inlet in the casing for delivery of air located at one end of the roller, an outlet in the casing located at the other end of the roller, deflector plates located in the casing between the inlet and the outlet, the deflector plates arranged so as to be inclined with respect to the axis of the roller and define transfer chambers said plates for the current of delivery air which travels around the axis of the roller, an air permeable wall at least partly covering the transfer chambers, the wall being permeable to air and dust, and at least one low pressure chamber comprising a hood connected to a suction pipe located above and in fluid communication with the air permeable wall.

4,964,197

APPARATUS FOR THE PRODUCTION OF NON-WOVEN MATERIAL FROM ENDLESS FILAMENTS

Kurt Mente, Hannover, and Gerhard Knitsch, Wedemark, both of Fed. Rep. of Germany, assignors to J.H. Benecke AG and Corovin GmbH, Hannover Peine, Fed. Rep. of Germany

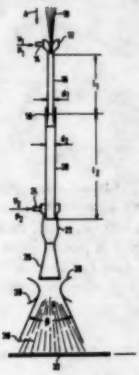
Division of Ser. No. 932,889, Nov. 20, 1986, Pat. No. 4,847,035.

This application Apr. 18, 1989, Ser. No. 340,068

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1985, 35411287

Int. Cl.[5] D01G *25/00*

U.S. Cl. 19—299 11 Claims



1. An apparatus for producing non-woven material from endless filaments comprising:

a filament draw off nozzle for drawing off said endless filaments;

a filament offlet disposed below said filament draw off nozzle for creating a filament draw off force;

a filament guide tube disposed below said filament offlet for guiding said filaments;

a spreading extruder for spreading said filaments disposed below said filament guide tube; and

a propelling nozzle disposed at an end of said filament guide tube located near said spreading extruder and oriented to direct compressed air toward said spreading extruder.

4,964,198

V-SHAPED CLIP FOR ATTACHING A SEMICONDUCTOR DEVICE TO A HEAT SINK

Alfred F. McCarthy, Belmont, N.H., assignor to Avvid Engineering, Inc., Laconia, N.H.

Filed Sep. 21, 1988, Ser. No. 247,367

Int. Cl.[5] H05K *7/20*

U.S. Cl. 24—458 5 Claims

1. A clip for attaching a semiconductor to a heat sink comprising:

a first surface,

said first surface having a flat section with a pair of sidewalls extending downwardly therefrom so as to define an opening adapted to receive a semiconductor when said clip is in use wherein said flat section contacts the semiconductor which is held in place by said sidewalls,

said flat section being connected to an upwardly angled spring section,

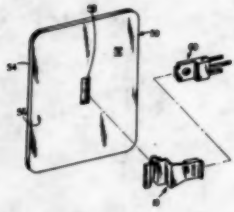
an attachment means,

said attachment means connected to said spring section of said first surface, said attachment means comprising a V-shaped portion having at least a first and a second leg, said legs being joined at one end to form an apex and being spaced apart at their opposite ends,

said V-shaped portion having a connecting leg, said connecting leg being attached to said spring section,

said V-shaped portion having lip means and shelf means which are spaced apart,

whereby when said clip is in use said V-shaped portion, which si resilient, is compressed so as to insert it into a slot in the heat sink, so that when said V-shaped portion



is allowed to flex back to is normal position, the portion of the heat sink adjacent to the slot is secured between said lip means and said shelf means and as a result when a semiconductor is placed in said opening, said spring section forces said flat section in a direction parallel to said V-shaped portion against said semiconductor to hold it in place on the heat sink.

4,964,199

SECURING ARRANGEMENT

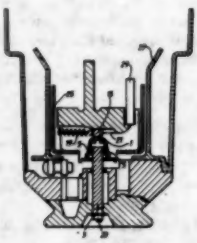
Peter Ridgewell, Salisbury, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Aug. 28, 1989, Ser. No. 399,114

Claims priority, application United Kingdom, Aug. 27, 1988, 8820418

Int. Cl.[5] A44B *11/25*; B63B *25/00*

U.S. Cl. 24—603 **7 Claims**



1. A securing arrangement for securing a circumferential grooved shaft in a housing wall, the arrangement comprising a cap member, collet means and a displaceable chock member, the collet means being arranged when within the cap member to engage the grooved shaft, the cap member having a shaped cavity whereby when the collet means engages the grooved shaft then an axial force is placed upon the cap member forcing it axially from the grooved shaft and so dis-engaging the collet means from the grooved shaft, the displacement chock member being arranged, in operation, to act against the axial force to prevent dis-engagement of the collet means from the grooved shaft, the displaceable chock member being readily displaceable such that the collet means may be rapidly dis-engaged from the grooved shaft so releasing the shaft from the housing.

4,964,200

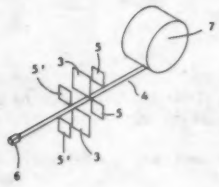
LEAD MAKING MACHINE HAVING IMPROVED CRIMPING PRESSES AND ACTUATING MECHANISM

Wayne E. Giesbrecht, Hersey; Howard C. Phillips, and David J. Erb, both of Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 22, 1989, Ser. No. 396,893

Int. Cl.[5] H01R *43/04*

U.S. Cl. 29—33 M **24 Claims**



1. A crimping press assembly for crimping electrical terminals onto the ends of wires, the press assembly having fixed tool holder means and movable tool holder means which have fixed and movable crimping tooling thereon respectively, a static press frame means and reciprocable ram means, the fixed tool holder means being carried by the frame means, the movable tool holder means being carried by the ram means, and actuating means for reciprocating the ram means thereby to move the movable crimping tooling between an open position and a closed position, the movable tooling being remote from the fixed tooling when it is in its open position and being proximate to the fixed tooling when it is in its closed position, the crimping press assembly being characterized in that:

the actuating means comprises a reciprocable rod having a guided portion and an actuating mechanism for reciprocating the rod, the frame means comprising means surrounding and guiding said guided portion of the rod,

the guided portion of the rod being parallel to the ram means and the rod having one of its ends adjacent to the ram means, the rod being connected to the ram means at the one end,

the actuating means having a first portion which is in engagement with the rod and which imparts reciprocative motion to the rod, the actuating means having a second portion which is in engagement with the frame means whereby,

during crimping of an electrical terminal onto a wire, the reaction forces resulting from the crimping process are transmitted from the movable and fixed tooling to the rod and the frame means respectively, and through the first and second portions of the actuating means.

4,964,201

DESCALING ABRADING APPARATUS WITH ABRADING ROLLS

Hiroshi Kajitani, Funabashi, Japan, assignor to Funayama & Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 74,997, Jul. 14, 1986, abandoned. This application Mar. 13, 1990, Ser. No. 492,228

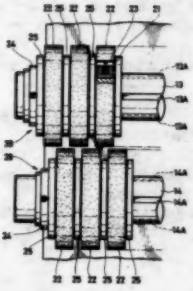
Claims priority, application Japan, Jul. 16, 1986, 61-167464

Int. Cl.[5] B23D *79/12*

U.S. Cl. 29—81.03 **3 Claims**

1. A descaling abrading apparatus comprising an apparatus frame, a bearing member, and a plurality of parallel abrading rolls borne horizontally by said bearing member, said abrading rolls each including a rotating shaft, disk-shaped abrading wheels successively mounted on said rotating shaft by means of a respective collar, and spring supporters each serving concurrently as a key and each disposed between one of said disk-shaped abrading wheels and said rotating shaft, the position of said disk-shaped abrading wheels of one of said parallel

abrading rolls being offset from that of said disk-shaped abrading wheels of another, adjacent abrading roll so that the abrading wheels of the former are each in facing relation to a portion intermediate adjacent abrading wheels of the latter, said bear-



ing member being supported by said apparatus frame so that said bearing member is movable vertically relative to said apparatus frame and said apparatus further comprising a pressurizing means for vertically downwardly pressurizing said bearing member.

4,964,202

HEATABLE ROLL FOR USE IN CALENDERS AND THE LIKE

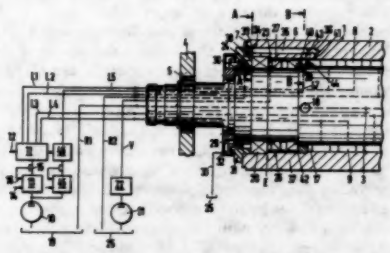
Josef Pav; Reinhard Wenzel, both of Krefeld; Hans Bresser, Kerken, and Rudolf Vossmerbäumer, Krefeld, all of Fed. Rep. of Germany, assignors to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Filed Apr. 27, 1989, Ser. No. 344,261

Claims priority, application Fed. Rep. of Germany, May 2, 1988, 3814794

Int. Cl.[5] B21B *13/02*

U.S. Cl. 29—116.2 **24 Claims**



1. A roll for use in web treating machines comprising a hollow rotary tubular shell having a longitudinal axis and internal space and first and second end portions each including a tubular section; first and second inserts installed in said space within said first and second end portions, respectively; a first heating device having means for heating said shell between said inserts; and a discrete second heating device having means for heating said shell in the region of said end portions, said second heating device including channels provided in the end portions of said shell and centrifugal pumps for circulating a heating fluid through said channels, said tubular sections forming part of the respective pumps.

4,964,203

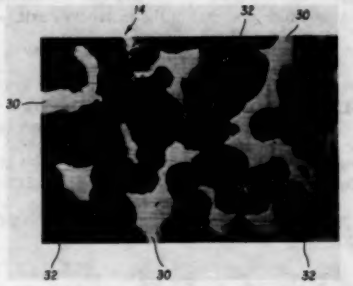
ALUMINUM SHOT BLASTED WEB CONVEYING ROLLER

Daniel C. Lioy; Edward F. Hurtubis, both of Rochester, and Edward R. Schickler, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 282,662, Dec. 12, 1988, Pat. No. 4,910,844. This application Oct. 25, 1989, Ser. No. 426,383

Int. Cl.[5] B21B *27/02*

U.S. Cl. 29—121.8 **2 Claims**



1. An aluminum web conveyance roller having a surface with generally spherical down features, many of the down features overlapping to form interconnected channels comprising at least 50% of the surface area of the roller, the depth of the down features being greater than about 500 microns but less than about 1000 microns, the surface having a plurality of plateaus between the channels comprising at least 20% of the surface area of the roller, the surface of the plateaus and down features being hardcoated, and the plateaus being smooth to avoid scratching a web conveyed by the roller.

4,964,204

METHOD FOR MAKING A GARTER-TYPE AXIALLY-RESILIENT COIL SPRING

Peter J. Balsells, P.O. Box 15092, Santa Ana, Calif. 92705, assignor to Peter J. Balsells and Joan C. Balsells, both of Santa Ana, Calif.

Division of Ser. No. 186,016, Apr. 25, 1988, abandoned. This application Sep. 5, 1989, Ser. No. 402,535

The portion of the term of this patent subsequent to Oct. 31, 2006, has been disclaimed.

Int. Cl.[5] B21F *37/02, 3/12*

U.S. Cl. 29—173 **7 Claims**

1. A method for making garter-type axially resilient coiled spring comprising the steps of:

fabricating by winding a metallic wire to produce coils canted with respect to a centerline of the garter-type axially resilient coiled spring, each coil having a leading portion and a trailing portion, said leading portion being disposed at a front angle, in a range from greater than 0 to 35 degrees, to a line normal to a centerline of the garter-

type axially resilient coiled spring and said trailing portion being disposed at a back angle to the normal line;

during fabricating of the wire adjusting the magnitude of the back angle in order to achieve preselected load-deflection characteristics of the garter-type axially resilient coiled spring; and

attaching two ends of the wound wire in a manner forming a garter-type axially resilient coiled spring with the trailing portion along the outside diameter of the garter-type axially resilient coiled spring and the leading portion along the inside diameter of the garter-type axially resilient coiled spring.

4,964,205

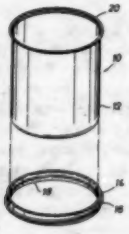
METHOD FOR MAKING SCREW CAP JAR

Paul M. Coffman, Houston, Tex., assignor to Rampart Packaging Inc., Williamsburg, Va.

Division of Ser. No. 205,964, Jun. 13, 1988, Pat. No. 4,844,270. This application Apr. 10, 1989, Ser. No. 335,313

Int. Cl.[5] B23P *11/00*

U.S. Cl. 29—401.1 **7 Claims**



1. A method for converting a thin-walled container to a jar with a rigid threaded neck which will accept a conventional threaded screw cap which comprises separately forming a thin-walled container and a rigid threaded neck ring and then attaching the ring to the outside of the container, wherein the neck ring is discontinuous and has a hinge on one side and an opposing opening which includes means for mechanical interlocking.

4,964,206

INTRAOCULAR LENS ANCHORING FILAMENT TO LENS ELEMENT FIXATION METHOD

Randall L. Knoll, Mahtomedi; James E. Aysta, Stillwater, and Wilhelm Lewon, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 168,394, Mar. 15, 1988. This application Apr. 12, 1990, Ser. No. 507,855

Int. Cl.[5] B23P *17/00, 19/02*; A61F *2/16*

U.S. Cl. 29—424 **12 Claims**

1. A method for fixing a haptic having an anchoring filament to a lens element in a soft intraocular lens comprising the steps of:

(a) forming in the lens element a passage having a width that is less than the greatest width of the anchoring filament;

(b) lubricating the anchoring filament of the haptic, the passage in the lens element, or both;

(c) inserting the anchoring filament end-first into the passage; and

(d) washing the intraocular lens to remove the lubricant.

4,964,207

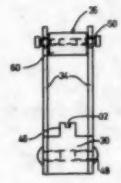
BLADE SETTING TOOL ASSEMBLY FOR A BLADE SEAL BAR AND METHOD OF USING

Gary R. Daniel, Chesterfield County, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Jul. 27, 1989, Ser. No. 385,837

Int. Cl.[5] B23Q *3/00*

U.S. Cl. 29—468 **11 Claims**



1. A blade setting tool assembly for clamping a plurality of blades in a blade retaining channel formed between a pair of clamping bars of a cutting tool, said blades having exposed blade edges adapted to project outwardly from the retaining channel, comprising:

(a) a blade positioning block having an upwardly directed blade positioning slot extending along its length to receive the exposed blade edges;

(b) a pair of mounting straps fixed to the blade positioning block and extending upwardly along opposite sides of the block a distance greater than the height of the cutting tool;

(c) an eccentric clamping roller including a throw portion and means for mounting said roller to extend between upper ends of said straps for rotation about a transverse axis extending through the upper ends;

whereby said blades are clamped between said clamping bars by positioning the block below the cutting tool with the exposed blade edges disposed within the blade positioning slot and the mounting straps extending upwardly along opposite sides of the cutting tool, followed by rotating said clamping roller along said axis of rotation to cause the throw portion to contact the top surface of the cutting tool and exert clamping force thereagainst which is transmitted by the straps and block to the blade positioning slot to cause the blades to be properly seated within the blade retaining channel with the exposed blade edges pressed firmly against the bottom of the blade positioning slot in a desired elevational relationship with each other, whereupon the clamping bars are tightened against each other to securely clamp the blades therebetween.

4,964,208

PARTS EXCHANGE MECHANISM OF CHIP MOUNTER

Teruhiko Fujioka, Tokyo, Japan, assignor to Tenryu Technics Co., Ltd., Shizuoka, Japan

Filed May 25, 1989, Ser. No. 357,710

Claims priority, application Japan, May 30, 1988, 63-71510[U]

Int. Cl.[5] B23Q *3/155*

U.S. Cl. 29—568 **4 Claims**

1. A parts exchange mechanism of a chip mounter, for ex-

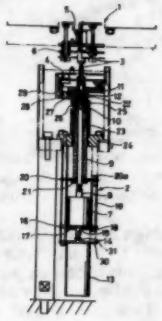
changing a suction bit and a positioner of the chip mounter, comprising:

a suction bit holding member and a positioner holding member respectively provided on a mounter head of the chip mounter so as to hold said suction bit and said positioner, respectively;

a collet chuck for holding said suction bit, which receives said suction bit from said suction bit holding member and delivers same thereto;

a chuck sleeve for applying a clamping force to said collet chuck or releasing same therefrom so as to cause said collet chuck to clamp or release said suction bit;

a first rod connected to said chuck sleeve;



a first actuator for causing said first rod to move in its axial direction;

a piston member connected to said collet chuck and capable of moving in its axial direction so as to receive said positioner from said positioner holding member and deliver same thereto while holding said positioner;

clamp pawls rocking about a pin so as to clamp or release said positioner held by said piston member;

a clamp pawl rocking means connected to said chuck sleeve, for applying a rocking force to said clamp pawls;

a post member connected to said piston member and said first actuator; and

a second actuator for causing said first actuator to move in its axial direction.

4,964,209

METHOD FOR PRODUCING A WIRE INCRUSTED WITH ABRASIVE GRAIN

Teruyuki Murai; Yoshihiro Hashimoto, both of Hyogo, and Takao Kawakita, Osaka, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 39,253, Apr. 17, 1987, Pat. No. 4,866,888. This application Apr. 5, 1989, Ser. No. 333,647

Claims priority, application Japan, Apr. 17, 1986, 61-89105; Apr. 17, 1986, 61-89106; Jun. 17, 1986, 61-141844; Jun. 17, 1986, 61-141845; Jun. 26, 1986, 61-150108

Int. Cl.[5] B21B *1/46*

U.S. Cl. 29—527.6 **16 Claims**

1. A method for producing a wire incrusted with abrasive grains, comprising the steps of:

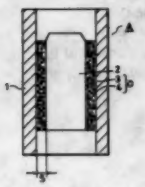
preparing a cylindrical metallic body having a metallic rod inserted into a central part of a metallic pipe with a gap formed between said rod and said metallic pipe;

filling said gap with mixed powder comprising metallic powder and abrasive grains having Mohs hardness of 6 or more;

hermetically sealing both ends of said gap;

heating by one of extrusion and rolling and subsequently cooling said cylindrical metallic body to produce a wire; and

removing outermost metallic material of said metallic body remaining as the outermost layer of said wire by a mechanical or chemical method to expose a mixed layer



comprising sintered metal of said metallic powder and said abrasive grains on the surface of the wire.

4,964,210

METHOD OF CONNECTING STATOR COIL OF MOTOR

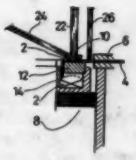
Kunio Takagi, Obu, Japan, assignor to Aisan Kogyo Kabushiki Kaisha, Obu, Japan

Filed Mar. 8, 1990, Ser. No. 490,296

Claims priority, application Japan, May 1, 1989, 1-112493

Int. Cl.[5] H02K *15/02*

U.S. Cl. 29—596 **3 Claims**



1. A method of connecting an end portion of a stator coil of a motor to a terminal, comprising the steps of:

locating an insulating plate on one end surface of a stator;

positioning said terminal on one side of said insulating plate opposite to the other side where said insulating plate contacts said stator;

positioning said end portion of said stator coil on one side of said terminal opposite to the other side where said terminal contacts said insulating plate;

pressing said end portion of said stator coil against said terminal with a contact end portion of a source electrode and a first earth electrode which are in contact with each other;

contacting a second earth electrode with said terminal from the opposite side of said insulating plate; and

supplying a welding current to said source electrode under the conditions that the contact end portion of said source electrode and said first earth electrode is pressed against said terminal and said end portion of said stator coil and that said second earth electrode is in contact with said terminal.

4,964,211

PARTS ASSEMBLING APPARATUS

Masaki Arao, Nagaokakyo, and Shinichiro Tsunemi, Takatsuki, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation-in-part of Ser. No. 48,611, May 11, 1987, abandoned. This application Jun. 13, 1989, Ser. No. 366,292

Claims priority, application Japan, May 14, 1986, 61-111335

Int. Cl.[5] B23Q *21/00, 15/00*

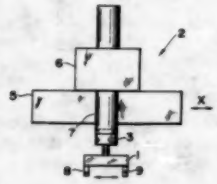
U.S. Cl. 29—705 **9 Claims**

1. A parts assembling apparatus for assembling a part onto a board by pressing the part onto the board, comprising:

holding means for holding said part at a predetermined position;

means for moving said holding means to a part assembling position on the board;

force sensor means for detecting a reaction force from the board which acts on said holding means when said part is pressed onto said board; and



means for comparing a detection output of said force sensor means with a predetermined reference data when the part is pressed onto said board and for determining an abnormality when a value represented by the detection output does not reach the reference data.

4,964,212

PROCESS FOR PRODUCING ELECTRICAL CONNECTIONS THROUGH A SUBSTRATE

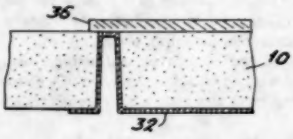
Patrice Deroux-Dauphin; Henri Sibuet, both of Saint Egreve, and Thierry Dupeux, Saint Martin d'Heres, all of France, assignors to Commissariat a l'Energie Atomique, Paris and Compagnie Europeenne de Composants Electroniques LCC, Courbevoie, both of, France

Filed Sep. 8, 1989, Ser. No. 404,410

Claims priority, application France, Sep. 29, 1988, 88 12750

Int. Cl.[5] H01K *3/10*

U.S. Cl. 29—852 **10 Claims**



1. Process for the production of electrical connections through a substrate comprising the steps of:

depositing at least one thin layer (12) of material on the substrate (10), the material of the at least one thin layer (12) being only slightly absorbent of a laser beam (26) such that the laser beam (26) passes through the at least one thin layer (12) without perforating the material to form an emergent beam (28) after passing therethrough;

exposing the substrate (10) with the at least one thin layer (12) material to the laser beam (26), the laser beam (26) being at least partially absorbed by the substrate (10) to drill a hole only in the substrate (10), the laser beam (26) passing through the at least one thin layer (12) of material withous perforation thereof to form a blind hole in the substrate (10) having a bottom formed substantially by the at least one thin layer (12) of material; and

forming electrical connections through the substrate (10) using the hole formed by the laser beam (26).

4,964,213

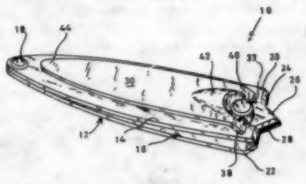
NAIL CUTTING DEVICE AND ASSOCIATED METHOD FOR TREATING AND/OR PREVENTING INGROWN NAILS

Patricia A. Suggs, Route 14, Box 831A, Sevierville, Tenn. 37862

Continuation-in-part of Ser. No. 106,167, Oct. 8, 1987. This application Sep. 7, 1988, Ser. No. 241,412

Int. Cl.[5] A45D *29/18*

U.S. Cl. 30—28 **6 Claims**



1. A nail cutting device for cutting a symmetrical V-shaped notch in the approximate center of the anterior extremity of a nail for treating and/or preventing ingrown nails, said device comprising:

a first member having a forward end portion defining a first jaw provided with a protruding cutting blade portion, said protruding cutting blade portion being disposed in the center of said forward end portion and V-shaped so as to cut said V-shaped notch in said nail;

a second member having a forward end portion defining a second jaw provided with an anvil operatively associated with said protruding V-shaped cutting blade portion; and

actuator means for moving said protruding V-shaped cutting blade portion toward and into contact with said second jaw whereby said V-shaped notch is cut into the approximate center of said nail by inserting said anterior extremity of said nail between said protruding cutting blade portion and said anvil of said second jaw and actuating said actuator means to force said cutting blade portion through said nail and against said anvil of said second jaw.

4,964,214

FLEXIBLE SAFETY RAZORS

Norman C. Welsh, Bradfield, and Oliver D. Oglesby, Tadley, both of England, assignors to The Gillette Company, Boston, Mass.

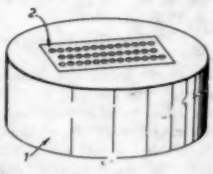
PCT No. PCT/GB88/00014, § 371 Date Jun. 23, 1989, § 102(e) Date Jun. 23, 1989, PCT Pub. No. WO88/04980, PCT Pub. Date Jul. 14, 1988

PCT Filed Jan. 11, 1988, Ser. No. 378,192

Claims priority, application United Kingdom, Jan. 9, 1987, 8700518; Apr. 7, 1987, 8708268

Int. Cl.[5] B26B *21/00*

U.S. Cl. 30—49 **16 Claims**



2. A safety razor in which a multi-edged blade means is mounted in a holder which presents a skin-engaging surface of material that is resilient and readily deformable surrounding the blade means,

different edges of the blade means being displaceable, rela-

tive to each other, to follow local deformation of the said surface,

said holder comprising a shaped block of plastics foam material of material that is resilient and readily deformable.

4,964,215

APPARATUS FOR CRACKING A MELON SEED

Hans Wu, No. 138, Hsia-Lin Road, Tainan, Taiwan

Filed Jun. 5, 1989, Ser. No. 361,214

Int. Cl.[5] A47J *43/26*

U.S. Cl. 30—120.1 **2 Claims**

1. An apparatus for cracking the hull of a melon seed having a round end and a tapered end, said apparatus comprising:

a flat plate having a protrusion projecting therefrom for positioning said round end of said melon seed and having a concavity means formed therein near said protrusion for receiving said melon seed;

a pair of cracking members each having a head portion pivoted to said flat plate near said protrusion and a handle portion extended from said head portion, each of said head portions having a clamping edge facing the other one of said head portions to clamp said tapered end of said melon seed, said clamping edge provided with a long groove for positioning said melon seed, and said handle portions positioned near said protrusion at either side thereof;

a spring means for urging said handle portions to move away from each other and urging said head portions to a position at which said melon seed may be released; whereby said melon seed can be cracked when said handle portions are moved toward each other.

4,964,216

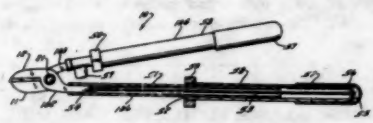
TORQUE LIMITING DEVICE FOR SHEARS

Robert G. Gosselin, Springfield, Mass., assignor to Fiskars Oy AB, Helsinki, Finland

Filed Jul. 5, 1988, Ser. No. 215,078

Int. Cl.[5] B26B *13/00*

U.S. Cl. 30—254 **22 Claims**



1. A shearing device comprising:

(a) a pivot mechanism;

(b) first and second handle levers rotatably mounted on said pivot mechanism and capable of being articulated between an open and closed position;

(c) first and second shearing members rotatably mounted on said pivot mechanism, said first members being integrally connected to said first lever;

(d) clutch assembly means positioned intermediate said pairs of levers and members for operatively connecting said second lever to said second member, said assembly means including

(i) first and second clutch plates each having respective facing surfaces with complimentary configurations; and

(e) biasing means positioned adjacent said plates for biasly forcing said surfaces into an abutting relationship, said surfaces having an intermeshing relationship when said plates are in a predetermined rotary alignment, said clutch assembly means responsive to a predetermined force of a level sufficient to overcome the force exerted by said biasing means generated when said handle levers are articulated toward said closed position and said shearing members encounter cut resistant material for camming said plate surfaces out of said meshing relationship and operatively disconnecting said second lever from said second member.

4,964,217

HANDLE FOR A CHAIN SAW

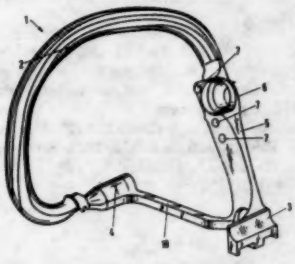
Reinhard Siede, Remshalden; Klaus Höppner, Marbach; Hermann Weiss, Steinheim, and Wolfgang Weissert, Leutenbach, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Apr. 7, 1989, Ser. No. 335,181

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1988, 3811788; Aug. 27, 1988, 8810851[U]

Int. Cl.[5] B23D *57/02*

U.S. Cl. 30—383 **13 Claims**



1. In a portable, handheld tool such as a motor-driven chain saw having a motor housing, a bail-shaped handle attached to the motor housing for supporting and manipulating the tool, the bail-shaped handle comprising:

a tubular holding portion having a tubular cross section and having respective ends and being adapted to be manually held by an operator of the tool;

first and second bearing portions for attaching said handle to said motor housing, said first and second bearing portions being connected to corresponding ones of said ends and being homogeneous with said holding portion;

connecting means extending directly between said bearing portions and being integral therewith for completing the bail-shaped handle;

said holding portion, said first bearing portion, said second bearing portion and said connecting means being interconnected in a continuous integral unit closed upon itself thereby imparting stability to the handle;

said integral unit being a plastic body which is hollow at least in the region of said holding portion; and,

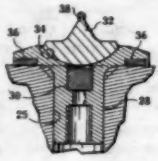
said integral unit having cross sections departing from said tubular cross sections and having different wall thicknesses at said cross sections.

4,964,218

OPTICAL OR LASER BALL TARGET ASSEMBLIES FOR PRECISION LOCATION MEASUREMENTS

Manfred Morghen, San Diego, Calif., assignor to General Dynamics Corporation, Convair Division, San Diego, Calif.

Filed Jul. 10, 1989, Ser. No. 377,642
Int. Cl.[5] G01C *15/06*
U.S. Cl. 33—293 **22 Claims**



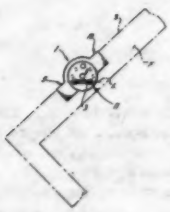
1. A target for precision location measurement comprising:
target means having a curvilinear surface thereon;
a support means for positioning and holding said curvilinear surface of said target means at a selected location;
a base means by which said support means is supported adapted to be positioned on a structure surface on which a location is to be measured;
said support means being rotatable about at least one axis passing through said target means and said structure surface;
whereby the location of points on said structure can be precisely located by measuring the position of said target means.

4,964,219

COMBINATION PLUMB/LEVEL INSTRUMENT FOR A TRY SQUARE

Gary E. Clark, Sikeston, Mo., assignor to Wade Parker, New Madrid, Mo., a part interest

Continuation-in-part of Ser. No. 128,799, Dec. 4, 1987, abandoned. This application Feb. 6, 1989, Ser. No. 306,061
Int. Cl.[5] G01C *9/20, 9/28*
U.S. Cl. 33—451 **2 Claims**



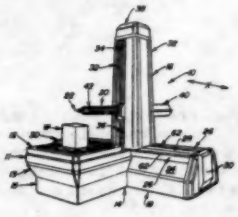
1. A leveling instrument for removable attachment to a try square of magnetizable material, comprising:
a spirit level;
a holder comprising a U-shaped channel having a web and generally parallel flanges wherein one flange extends farther than the other flange, said other flange being the shorter flange, by a distance not greater than the thickness of the try square;
a permanent magnet secured to the underside of the web of the channel and having a flat undersurface flush with the edge of the shorter flange of said channel;
an alignment plate secured to the top side of the web of the channel having a flat surface flush with the web of the channel, the web and alignment plate forming an upper mounting surface having a plurality of alignment holes therein;
a generally circular plate rotatable relative to the holder and having a single alignment hole therein adjacent its perimeter;
two stanchions secured to the exterior surface of said rotatable plate receiving opposite ends of the level; and
a spring-loaded detent carried by the rotatable plate adapted to removable extend through the single alignment hole into a selected one of said alignment holes in said alignment plate to position the rotatable plate and the level at a preselected angular position relative to the flange that extends farther than the shorter flange whereby the try square may be used to ascertain inclinations.

4,964,220

COORDINATE MEASURING MACHINE WITH COVER SYSTEM

Ladd Orr, Ft. Meyers, Fla.; Freddie L. Raleigh, Centerville, and Thomas L. Hemmelgarn, Dayton, both of Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Apr. 3, 1989, Ser. No. 331,727
Int. Cl.[5] G01B *5/03*
U.S. Cl. 33—503 **14 Claims**



1. In combination with a coordinate measuring machine (10) of the type including a horizontal probe shaft assembly (20) supported on a machine base section (18) for movement along three orthogonal axes (X,Y,Z) by a X-axis carriage (50) guided along a set of spaced apart X-axis way members (24) fixed atop said base section (18); said X-axis carriage (50) disposed between said X-axis way members (24) and extending horizontally, a Y-axis carriage (106) guided along a set of ways (108) extending vertically along a Y axis column member (88) fixed to said X-axis carriage (50), said probe shaft assembly (20) supported on said Y-axis carriage (106) for vertical movement, the improvement comprising a cover system overlying said sets of ways (46, 108), said cover system comprising a pair of rigid X-axis cover members (26) each having a bottom fixed atop a respective X-axis member (24) and having a side extending upwardly therefrom and each cover member 26 also having a rigid flange portion (62) at the top of the side of each X-axis cover member (26), said flange portions (62) extending towards each other with a gap therebetween through which gap moves said Y-column member (88) and said X-axis carriage (50).

4,964,221

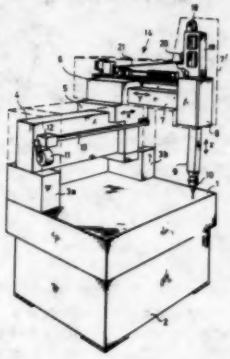
COUNTERBALANCED COORDINATE-MEASURING INSTRUMENT

Karl-Hermann Breyer, Heidenheim, and Franz Starp, Wildbad, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

Filed Jun. 19, 1989, Ser. No. 367,777
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1988, 3823042
Int. Cl.[5] G01B *5/03*
U.S. Cl. 33—503 **4 Claims**

1. A coordinate-measuring instrument having a vertically displaceable measurement slide, a drive for the measurement slide, and a device to compensate for the weight of the mea-

surement slide; the device for weight compensation comprising a helical spring (31) having a working range which is small as compared with its length in relaxed sate, a stepdown belt transmission (21–23) interposed between the spring (31) and

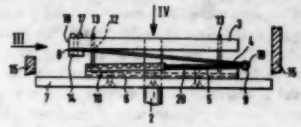


the measurement slide (9), the drive (15–17) and the spring (31) being connected to a pulley (22/23) of the belt transmission; means to compensate for variation in spring force within the working range of the spring (31), said means comprising an eccentrically mounted pulley (123) of the belt transmission.

4,964,222
RING SIZER
Robert L. Keener, 3115 Furneaux Rd., Carrollton, Tex. 75007
Filed Jan. 19, 1990, Ser. No. 467,186
Int. Cl.[5] G01B *3/00*
U.S. Cl. 33—544.4 **9 Claims**

1. A ring sizer comprising a generally cylindrical stick having a diameter which tapers from one end thereof to the other, said stick being formed of pliable, substantially seamless material and adapted to distort locally to accommodate the contour of a ring being sized while resisting distortion sufficiently to enable correct sizing of said ring.

4,964,223
DYNAMIC FEELER HEAD
Kurt Linder, Karlsruhe, and Werner Gurny, Wadgassen, both of Fed. Rep. of Germany, assignors to Wegu-Messtechnik GmbH, Wadgassen, Fed. Rep. of Germany
Filed Aug. 9, 1988, Ser. No. 230,470
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1987, 3727923; Feb. 4, 1988, 3811235
Int. Cl.[5] G01B *5/20*
U.S. Cl. 33—556 **15 Claims**

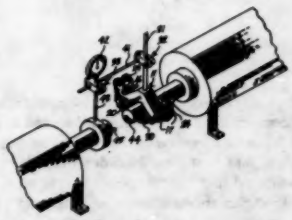


1. A dynamic feeler head for measuring machines and for utilization in processing machines for the solving of measurement tasks, including a centrally inserted feeler which is deflectable in at least two coordinate directions, said feeler being tiltable about a tilting axis which is always equally distant from the feeler and always located in the same plane, and signal transmission means responsive to the deflection of the feeler comprising:

a packet of five superimposed arranged plates equipped with equally lengthy lever arm, two of said plates being an upper outer plate and a lower outer plate, respectively, three of said plates, arranged intermediate the outer plates, being leaf springs which are articulately joined with each other and with the outer plates along longitudinal edge regions of the plates such that the path or flow of force during the deflection of the feeler in the X and Y coordinate directions extends from the upper outer plate through an articulated joint to the first leaf spring plate, from the first leaf spring plate through an oppositely located articulated joint to the second leaf spring plate, from the second leaf spring plate through a further articulated joint, which is offset by 90°, to the third leaf spring plate, and from said third leaf spring plate through a further oppositely located articulated joint to the lower outer plate; and

cylinder means slit along a longitudinal cylinder axis for clamping said articulated joints of the leaf spring plates.

4,964,224
SHAFT ALIGNMENT APPARATUS
Lawrence B. Jackson, 515 S. 5th, Kelso, Wash. 98626
Filed Jul. 18, 1989, Ser. No. 381,473
Int. Cl.[5] G01B *3/38*
U.S. Cl. 33—645 **6 Claims**



1. A shaft alignment apparatus for coaxial alignment of spaced first and second shafts comprising,

a clamp means for securement about the first shaft mounting a support rod extending above said clamp means, and

a first clamp member secured to the support rod, and

the first clamp member securing an alignment rod proximate a first end thereof orthogonally relative to the support rod, and

a second clamp member secured to the alignment rod proximate a second end thereof spaced from the first end, and

a dial indicator secured to a dial indicator shaft, the dial indicator shaft secured to the second clamp member, orthogonally relative to the alignment rod overlying the second shaft, and

wherein the clamp means includes a "W" shaped yoke with a central plate including spaced parallel forward and rear edges with the forward edge mounting a forward plate and the rear edge mounting a rear plate with the forward and rear plates spaced parallel relative to one another and of equal configuration, the forward and rear plates define first and second pairs of legs aligned relative to one another and extending downwardly relative an upper surface of the support plate at an acute angle thereto, and the first and second pairs of legs in each include first and second pairs of ears respectively with each of the first and second pairs of ears extending upwardly therefrom, the first and second pairs of ears including pairs of first and second apertures directed through the respective first and second ears, the first apertures coaxially aligned relative to one another and of a first diameter and the second apertures coaxially aligned relative to one another and of an equal first diameter, and the first and second apertures rotatably mounting a respective first and second pivot cylinder, and the first and second pivot cylinder mounting a chain for securement about the first shaft.

4,964,225

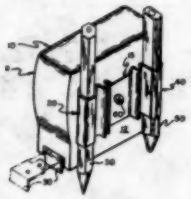
DUAL METAL CLIP

Arthur Waldherr, 201 Freeport Dr., Bloomingdale, Ill. 60108

Filed May 12, 1989, Ser. No. 351,090

Int. Cl.[5] G01B *3/10*

U.S. Cl. 33—768 **14 Claims**



1. A one-piece clip for use with a retractable measuring tape container, comprising a flat portion connected at one end to a first pencil holder and connected at the other end to a second pencil holder, said first pencil holder shaped to receive and hold a pencil, said first pencil holder having adjacent surfaces forming 60° angles therebetween, said second pencil holder shaped to receive and hold a carpenter's pencil hexagonal in transverse cross section, said second pencil holder having adjacent surfaces forming 60° internal angles therebetween, and sinuous means intermediate said first and second pencil holders connected thereto and to said flat portion for cooperating with a releasable fastener mechanism on the container for maintaining said clip firmly against the side of the container for a retractable measuring tape.

4,964,226

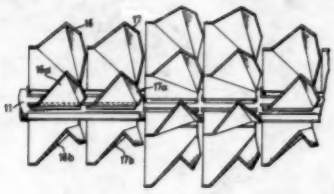
HIGH TURNDOWN ROTARY DRYER FLIGHTS

Richard J. Gobel, Scappoose, Oreg., assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 6, 1989, Ser. No. 418,421

Int. Cl.[5] F26B *11/02*

U.S. Cl. 34—136 **21 Claims**



17. A center flight for a center shaft in a dryer drum for drying bulk material, in which the drum and the center shaft rotate about a longitudinal axis of the drum and shaft, said center flight comprising:

first, second and third panels each being of substantially flat, plate-like construction, and being disposed at angles relative to each other;

said first panel being adapted for attachment to the center shaft along a connecting edge oriented substantially axially along the shaft, said first panel including a relatively longer upstream edge and a relatively shorter downstream edge;

said second panel being connected to said first panel along a common edge with said first panel, said common edge extending from a radially outer edge of said first panel to said downstream edge of said first panel, said second panel being angularly disposed angularly rearwardly from said first panel in the direction of rotation of said shaft; and

said third panel being connected to said second panel along a common edge with said second panel, said third panel being disposed generally angularly forwardly from said second panel in the direction of rotation of said shaft.

4,964,227

APPARATUS FOR DRYING FINELY DIVIDED SOLIDS

Uwe Christiansen, Gelnhausen, Fed. Rep. of Germany, assignor to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

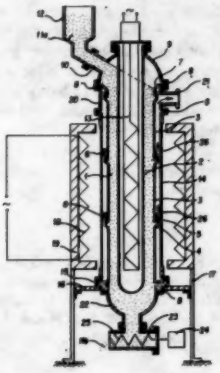
Filed Mar. 27, 1989, Ser. No. 329,726

Int. Cl.[5] F26B *17/12*

U.S. Cl. 34—175 **12 Claims**

1. Apparatus for the continuous drying of finely divided solids by the evaporation of moisture adhering thereto, which has a vertical drying chamber between an inner tube and an outer tube, to the upper end of which a connection for feeding moist solids leads, and at the lower end of which a hopper for the discharge of dried solids is provided, and which has a heat source surrounding the outer tube, characterized in that the outer tube is composed of a plurality of tube sections (3) of a material permeable to infrared radiation, received one into the other, the upper end of each tube section (3) being in the shape of a funnel (4) surmounted by a collar (5) and the bottom end

being plain, and on each bottom end of a tube section extending into an upper end of a tube section a spacer (6) is fastened, and



that the heat source, in the form of infrared radiation means, is disposed at a distance from the outer tube.

4,964,228

DRYER DOOR MECHANISM

Randall R. Coffman, Palatine, Ill., assignor to Norman Dryer Company, Inc., Crystal Lake, Ill.

Filed Apr. 7, 1989, Ser. No. 334,470
Int. Cl.[5] F26B *25/00*
U.S. Cl. 34—242 **16 Claims**

1. A dryer door mechanism for the opening, closing and sealing of a generally planar opening to a dryer enclosure comprising:

a door frame having two generally parallel sides;

a movable door mounted within said door frame having a generally planar interior surface and two generally parallel sides, said interior surface and two generally parallel sides, said interior surface being formed to sealingly abut said enclosure opening; and

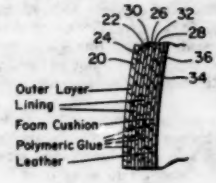
a pair of guideways located at opposite sides of said movable door, each guideway including a track means having an upper end and a lower end connected to a side of said door frame and track follower means connected to said movable door for translatably attaching said movable door to said track means, said track means being parallel to one another and angularly disposed with respect to the plane of said enclosure opening with said upper ends being spaced further from said enclosure opening than said lower ends, said movable door being translatable along said track means simultaneously parallel and perpendicular to the plane of said enclosure opening between closed and open positions, said track means wedging said movable door against said dryer enclosure as said movable door translates to said closed position such that said interior surface of said door is wedged with a force normal to said enclosure opening into sealing abutment with said enclosure opening.

4,964,229

METHOD AND APPARATUS FOR VACUUM MOLDING MULTI-LAYER FOOTWEAR

Raymond Laberge, Comte de Chambly, Canada, assignor to Sport Maska, Inc., St. Hyacinthe, Canada

Filed Feb. 3, 1989, Ser. No. 306,011
Int. Cl.[5] A43B *7/18*; A43D *9/00*; B29H *7/08*
U.S. Cl. 36—93 **15 Claims**



1. Remoldable multi-layer footwear capable of being molded on more than one occasion, said footwear comprising:

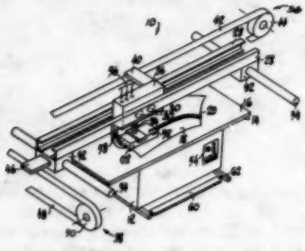
a boot,

said boot including a plurality of layers of material, said plurality of layers include natural and synthetic thermoplastic material of various segments, patterns and shapes located in different areas of said boot for varying flexibility at different areas of said boot, said plurality of layers being secured to each other by polymeric glue, said polymeric glue being capable of maintaining its adhesive effectiveness over repeated heating and cooling, said polymeric glue having a melting point higher than a softening temperature of synthetic components of said plurality of layers so that when said boot is heated and then molded by a pressure differential, said polymeric glue maintains its adhesive effectiveness to secure said layers of material together.

4,964,230
GUIDE RAIL SUPPORTED SEAM IRONING APPARATUS

Dieter Mai, Walleshausen, Fed. Rep. of Germany, assignor to Veit GmbH & Co., Landsberg/Lech, Fed. Rep. of Germany

Filed May 31, 1989, Ser. No. 359,392
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1988, 3818898
Int. Cl.[5] D06F *71/30*
U.S. Cl. 38—1 B 19 Claims

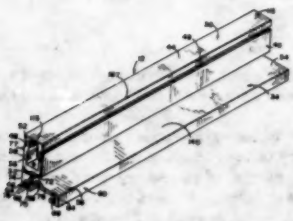


1. An ironing apparatus for ironing fabric parts, said apparatus comprising:
a work table adapted to receive a fabric part thereon;
at least one guide rod supported above said work table;
at least one guide rail axially oriented substantially perpendicular to said at least one guide rod and journaled thereto, said at least one guide rail being moveable in the axial direction of said at least one guide rod over said work table;
a steam iron adjustably suspended from said guide rail and moveable relative thereto in substantially the axial direction thereof, said steam iron being moveable relative to said guide rail above said work table for ironing a fabric part placed thereon.

4,964,231
FRONT-MOUNT GRID FRAME

H. Thomas De Maat, Holland, and H. Jay Schoeppe, II, Hudsonville, both of Mich., assignors to Silent Sound Systems, Inc., Grand Rapids, Mich.

Filed Jun. 10, 1988, Ser. No. 205,414
Int. Cl.[5] A47G *1/06*
U.S. Cl. 40—152 33 Claims

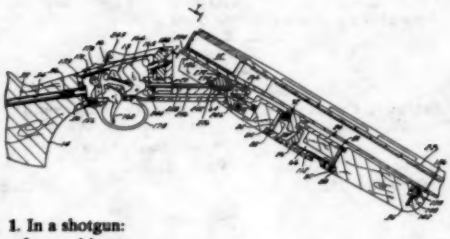


1. A grid display for mounting a number of display insert units comprising:
a plurality of elongate frame members cooperatively interconnected to form a plurality of openings for receiving the display inserts, a number of said frame members being interconnected to form an outer peripheral frame confining a certain space, and a number of said frame members being positioned to divide the confined space into a plurality of openings for receiving the display inserts, each said frame member having an upraised portion and a base portion, said frame members dividing said confined space extending thereacross in crossing intersecting relationships and further including cut-outs cooperating with one another to form a substantially planar grid pattern;
a plurality of connector elements each including a peripheral surface having a gap, said gaps being adapted to receive said base portions of said frame members defining the outer peripheral frame to support them in their proper positions; and
means for retaining said display insert unit in said openings formed by said frame members.

4,964,232
SINGLE BARREL BREAK-ACTION TRAP SHOTGUN

Donald R. Mainland, and Keith J. Sprangers, both of Racine, Wis., assignors to U. S. Competition Arms, Inc., Racine, Wis.

Filed Aug. 30, 1989, Ser. No. 400,725
Int. Cl.[5] F41C *7/11*
U.S. Cl. 42—44 19 Claims

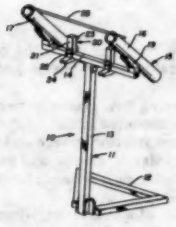


1. In a shotgun:
a fore-end iron;
a barrel connected to said fore-end iron;
a fore-end wood handgrip rigidly secured to said fore-end iron and spaced from said barrel;
and a resilient heat-resistant low-friction member rigidly secured to said fore-end wood handgrip and tightly engaged with said barrel.

4,964,233
FISHING SIGNAL DEVICE

James A. Benson, 469 W. State St., Sharon, Pa. 16146, and James M. Benson, 8017 Sharon-Warren Rd., Masury, Ohio 44438

Filed Feb. 1, 1990, Ser. No. 473,473
Int. Cl.[5] A01K *97/12*
U.S. Cl. 43—17 5 Claims



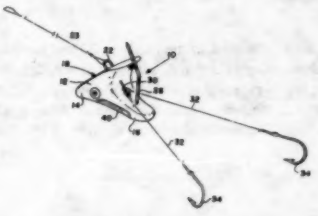
1. A fishing signaling device comprising a support frame having a base, a support element extending from said base, a mounting bar removably secured to said support element in spaced relation to said base, at least one fishing rod and reel holder secured to said mounting bar, at least one signaling

device adjacent said rod and reel holder, said signaling device comprises an upstanding element pivotally secured to said mounting bar, a striker bracket perpendicularly aligned with said upstanding element on said mounting bar, a line engagement means extending from said element in spaced relation to said mounting bar, means for aligning a fishing line from a fishing reel for engagement with said line engagement means.

4,964,234
FISHING AID

Brian I. Davey, 278 Barbet Road, Benoni, Transvaal, South Africa

Filed Jul. 3, 1989, Ser. No. 374,872
Claims priority, application South Africa, Jul. 5, 1988, 88/4778; Aug. 11, 1988, 88/5927
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—44.2 **12 Claims**



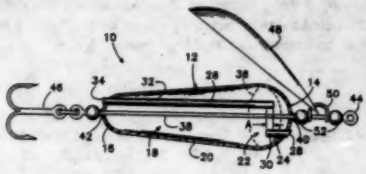
1. A fishing aid comprising:
(a) a body having a nose and a tail defining a keel;
(b) an attachment point on the body to which a towing line is attachable to suspend the body on the towing line;
(c) a water impingement surface on the body;
(d) means on the body for securing thereto the snout of a baitfish so that the baitfish is towed behind the body when the body is towed through water by the towing line; and
(e) an underslung mass provided by the body below the attachment point, the mass being so arranged in relation to the attachment point, water impingement surface and snout secural means that the body when suspended on the towing line is orientated for its water impingement surface to be inclined upwardly relative to the horizontal and for the nose and tail of the body to be aligned generally horizontally, the water impingement surface when the suspended body is towed through water by the towing line being impinged upon by the water, the water imparting movements to the body during such towing which are transmitted to the baitfish to cause the baitfish to execute a naturally orientated, swimming-like motion through the water.

4,964,235
DISPENSING FISH LURE

Charles Gruelle, P.O. Box 721, Battle Ground, Wash. 98604

Filed Jul. 13, 1989, Ser. No. 379,090
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.06 **19 Claims**

1. A fishing lure comprising:
a liquid-dispensing cavity for receiving a fish-attracting liquid, said cavity having front end, a rear end and a wall extending thereabout, the lure being drawn through a body of water front-end first;
an inlet port located at said front end of said cavity for allowing entry of environmental water into said cavity;
an outlet port located at said rear end of said cavity for allowing exit of a mixture of environmental water and fish-attracting liquid into the water environment; and
turbulent-mixing means for mixing the fish-attracting liquid and environmental water in said cavity, wherein said mixing means includes an inlet passage, connected to said inlet port, and an outlet passage, connected to said outlet port, each of said passages extending through said wall into said cavity, the free end of said inlet passage being

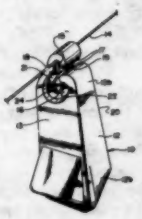


located downstream of the free end of the said outlet passage to promote turbulence within said cavity for mixing the fish-attracting liquid and the environmental water.

4,964,236
FISHING LINE SLIP SINKER WITH QUICK ATTACHMENT/DETACHMENT MEANS

Nicholas S. Adams, 1821 Squaw Point Rd. North, Brainerd, Minn. 56401

Filed Jul. 25, 1989, Ser. No. 385,233
Int. Cl.[5] A01K *95/00, 93/00*
U.S. Cl. 43—44.92 **24 Claims**



1. A slip sinker for quick attachment to and detachment from a fishing line comprising;
a weighted portion including a sinker eyelet; and
a fishing line connection portion including securing means comprising a sinker receiving cavity and a raised portion within said cavity for engagement with said sinker eyelet for selectively securing said line connection portion to said weighted portion, said line connection portion further including a quick attachment/detachment means for selective attachment to and detachment from a fishing line, said attachment/detachment means including an outer surface, a fishing line receiving eyelet an elongated pathway extenting from said eyelet to said outer surface and at least

one restriction in said pathway, said pathway defined by a pair of spaced wall portions which are spaced apart a distance greater than the fishing line diameter to permit the fishing line to freely pass therethrough, said restriction having a line passage dimension less than the fishing line diameter so as to permit passage of the fishing line past said restriction as a result of manual force.

4,964,237

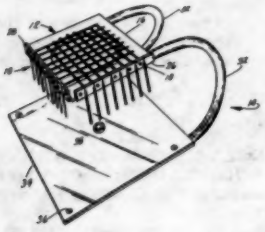
BOUQUET ASSEMBLY DEVICE

Lahna J. Specht, 17750 Fruitport Rd, Spring Lake, Mich. 49456

Filed Jul. 8, 1988, Ser. No. 216,822

Int. Cl.[5] A01G *5/00*

U.S. Cl. 47—41.01 **13 Claims**



1. A bouquet assembly device comprising:

a platform and edge means defining a through aperture in said platform;

a first set of individual lines extending from a first portion of said platform to individual end portions of said first set of individual lines and a second set of individual lines extending from a second portion of said platform to individual end portions of said second set of individual lines, said first and second portions being angularly offset 90° from each other around said aperture;

first retaining means positioned across said aperture from said first portion for individually releasably retaining the end portion of each individual one of said first set of individual lines and second retaining means positioned across said aperture from said second portion for individually releasably retaining the end portion of each individual one of said second set of individual lines in a manner that said first and second sets of lines are in tension across said aperture and wherein said first set of lines traverse said second set of lines in a grid pattern; and

support means for supporting said platform above a horizontal surface, whereby a bouquet can be assembled with greens and flowers supported in said aperture between the lines and the lines can be readily removed from the device and from the bouquet after assembly.

4,964,238

AUTOMOTIVE WINDOW REGULATOR

Hirotaka Nishijima, Yokohama City, and Satoru Ugawa, Hadano City, both of Japan, assignors to Nissan Motor Co., Ltd. and Ohi Seisakusho Co., Ltd., both Yokohama City, Japan

Continuation of Ser. No. 106,963, Oct. 13, 1987, abandoned, which is a continuation of Ser. No. 745,176, Jun. 17, 1985, abandoned. This application Apr. 24, 1989, Ser. No. 342,141

Claims priority, application Japan, Jun. 18, 1984, 59-123677

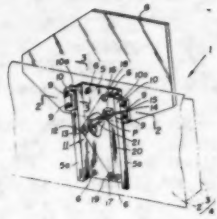
Int. Cl.[5] E05F *11/48*

U.S. Cl. 49—352 **8 Claims**

1. A window regulator positionable in a vehicle for independently raising and lowering a window pane, the window regulator providing the exclusive support and guidance for the window pane, comprising:

a guide plate fixedly attachable to the vehicle and having a pair of generally parallel, substantially vertical ends;

a pair of sliders, each slider being fixedly attachable to the window pane and slidably securable to a respective vertical end of the guide plate; and



drive means attached to the guide plate and connected to the window pane at a point between the sliders so as to be operable to directly drive the window pane for raising and lowering the pane while the pane is being guided by the sliders sliding along the vertical ends of the guide plate.

4,964,239

MACHINE FOR GRINDING THE EDGES OF A LENS

Lutz Gottschald, Meerbusch, and Klaus Eickmeyer, Haan, both of Fed. Rep. of Germany, assignors to Wernicke & Co. GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 15, 1989, Ser. No. 452,613

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1988, 3842601

Int. Cl.[5] B24B *17/00*

U.S. Cl. 51—101 LG **11 Claims**

1. In a machine for grinding the edges of a spectacle lens, including shaft halves for holding said lens therebetween, a grinding wheel for machining the periphery of said lens, a support means for a template that is held by one of said shaft halves, and a measuring head that is connected to a computer and serves for the measurement of the position of the front and rear sides of said lens at the grinding or contact point, in the vicinity of the periphery of said grinding wheel, relative to a prescribed plane, the improvement wherein:

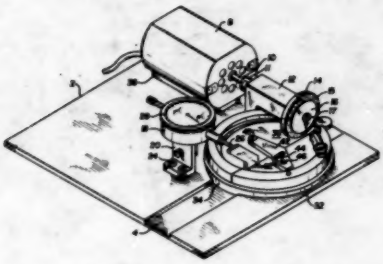
said measuring head has a fork-like configuration, including fork legs that are disposed parallel to one another and to said prescribed plane, and are spaced from one another by a distance that is greater than the greatest width of the periphery of said lens, whereby said shaft halves, with said lens, carry out oscillating back and forth movements relative to said grinding wheel, with said measuring head, or vice versa.

4,964,240

PISTON RING GRINDER

Philip C. Martino, 110 Larchwood Drive, Turtle Creek, Pa.

Filed Jun. 21, 1988, Ser. No. 209,468
Int. Cl.[5] B24B *41/06*
U.S. Cl. 51—125.5 **22 Claims**



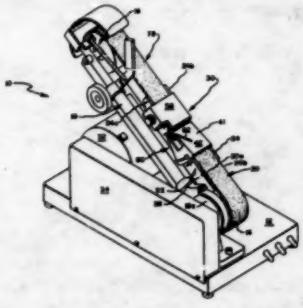
1. A piston ring grinding apparatus comprising:
a base member having slot means,
piston ring grinding means mounted on the base member,
a piston ring holder which is at least rotatably mounted on the base member for movement of a piston ring mounted thereon into and out of contact with the grinding means, and comprising a cup and turntable, and
gauge means mounted on the base member for gauging rotational movement of the piston ring holder,
said gauge means being in operable engagement with the piston ring holder, and having means connected to said operable means for indexing a desired amount of material to be removed from the piston ring and for indicating the actual amount of material being removed from the piston ring upon the rotational movement of the piston ring holder,
said cup being slidable within said base member, and
said turntable being mountable and rotatable within said cup.

4,964,241

BLADE SHARPENER

Norman T. Conklin, 136 Marycrest La., West Seneca, N.Y. 14224

Filed Sep. 11, 1989, Ser. No. 405,890
Int. Cl.[5] B24B *21/10*
U.S. Cl. 51—135 R **14 Claims**



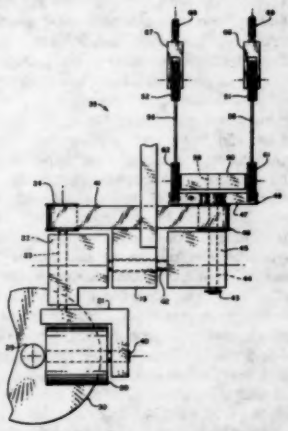
1. In a sharpening device for sharpening a blade having a cutting edge defined by cutting edge surfaces converging towards one another from adjacent opposite side surfaces of said blade, said cutting edge surfaces defining an edge angle and said side surfaces defining a blade angle, the improvement for sharpening said blade to provide a desired edge angle comprising in combination:
means for driving abrasive means for movement along a path of travel;
support means having a planar supporting surface for supporting said side surfaces by surface-to-surface to position said edge surfaces in engagement with said abrasive means, said support means being adjustable for varying an included angle defined by said supporting surface and said abrasive means to arrange said edge surfaces in engagement with said abrasive means for removing material therefrom as required to provide said desired edge angle; and
included angle control means for cooperating with said supporting surface to measure said blade angle and provide edge angle indicia for adjusting said included angle as required to effect sharpening of said blade to provide said desired edge angle.

4,964,242

APPARATUS FOR TEXTURING RIGID-DISKS USED IN DIGITAL MAGNETIC RECORDING SYSTEMS

Frank D. Ruble, Saratoga; Roger R. Stearman, San Mateo, and Robert A. Smith, Berkeley, all of Calif., assignors to Exclusive Design Company

Filed Sep. 22, 1989, Ser. No. 410,987
Int. Cl.[5] B24B *21/12, 5/00, 7/00*
U.S. Cl. 51—144 **17 Claims**



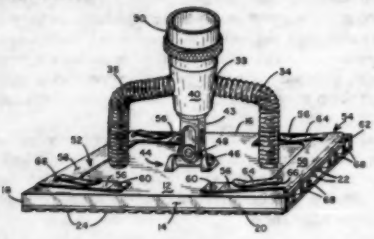
1. An apparatus for texturing the front and back surfaces of a rigid-disk substrate used in magnetic recording systems comprising:
means for rotating said substrate in a stationary plane;
first and second mechanical assemblies each including an abrasive tape, an load-bearing roller member, and means for moving said tape over said roller member;
means for applying a first force to each of said roller members to press said tape against said substrate surface, and for applying a second force to each of said roller members to distribute said first force across said substrate surface;
coupling network for mechanically coupling said first and second assemblies such that said first and second forces applied to said front substrate surface are identical to said first and second forces applied to said back substrate surface.

4,964,243

VACUUM POLE SANDER

John P. Reiter, 10407 Quebec Ave. South, Bloomington, Minn. 55438

Filed Jul. 10, 1989, Ser. No. 377,262
Int. Cl.[5] B24B *23/00, 55/06, 15/00*
U.S. Cl. 51—180 **6 Claims**



1. Sanding apparatus comprising:

(a) a sanding head including

(i) a generally rectangular planar base member having first and second vacuum ports formed through the thickness dimension thereof at spaced-apart locations on either side of a transversely extending center line, said base member having four mutually perpendicular side edges;

(ii) a rectangular planar, rigid air-distribution member cooperating with said four side edges and said planar base member to create a vacuum chamber, said air-distribution member including a pattern of apertures extending therethrough;

(iii) an array of raised pedestals of equal height extending outwardly from said air-distribution member to define interconnected channels leading from the periphery of said air-distribution member to said pattern of apertures, said array of pedestals adapted to support a perforated abrasive sheet member thereon;

(b) an elongated tubular pole having an open end and a closed end and joined to said planar base member of said sanding head by a universal joint disposed at said closed end and with first and second diametrically opposed side ports extending through the wall of said tubular pole a predetermined distance proximal of said closed end; and

(c) a pair of flexible hoses coupled individually and bilaterally symmetrically relative to said planar base member between said first and second side ports and said first and second vacuum ports, said pair of flexible hoses being sufficiently rigid to restrict free movement of said base member relative to said tubular pole while allowing pivoting of said sanding head relative to said pole about two mutually perpendicular axes when said sanding head is pushed with a predetermined force against a surface to be sanded, the arrangement being such that a source of vacuum coupled to said open end of said tubular pole creates a relatively uniform negative pressure within said vacuum chamber.

4,964,244

ENERGY DISSIPATING RECEPTACLE FOR HIGH-VELOCITY FLUID JET

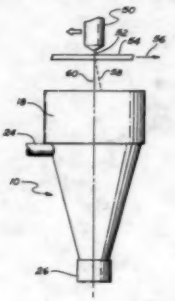
Uwe Ehlbeck, Darmstadt, Fed. Rep. of Germany, assignor to Flow Systems, Inc., Kent, Wash.

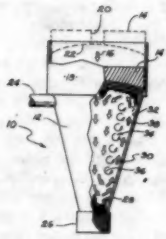
Continuation of Ser. No. 753,480, Jul. 10, 1985, Pat. No. 4,669,229. This application Dec. 2, 1986, Ser. No. 937,068
The portion of the term of this patent subsequent to Jun. 2, 2004, has been disclaimed.
Int. Cl.[5] B24B *55/04*
U.S. Cl. 51—270 **10 Claims**

1. An energy dissipating receptacle for receiving a high velocity jet of fluid comprising:

a body having an internal cavity for receiving a high velocity jet of fluid;

a circulating bed of suspensoids within the cavity responsive to the reception of the high velocity jet in the cavity to





cause the jet to impact generally equally on a large number of the suspensoids comprising the bed; and

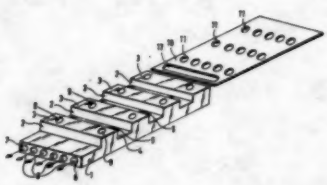
means for permitting the egress of dissipated fluid from the cavity while retaining the suspensoids therein.

4,964,245

GRINDING ELEMENT FOR A GRINDING TOOL BODY

Gerd Braasch, Sassenberg 31, 4475 Sogel, Fed. Rep. of Germany

Filed Dec. 12, 1988, Ser. No. 283,283
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1987, 8716524[U]; Mar. 4, 1988, 8802927[U]
Int. Cl.[5] B24D *11/00*
U.S. Cl. 51—407 **12 Claims**



1. A grinding element in combination with a grinding tool body of a vibratory grinding tool,

said grinding tool body having suction ducts therein for sucking grinding dust through inlets in recesses in a working surface thereon, the suction inlets being connectable to a vacuum system via the suction ducts in the grinding body,

said grinding element comprising:

a sheet coated on a first side with an abrasive material, said sheet having a second side covering the working surface on the grinding body, said sheet having at least two open areas therein coinciding with the recesses in the working surface, said second side of said sheet being roughened to better frictionally engage the working surface;

said sheet being roughened by applying a rough surface layer to said second side of said sheet, said layer being formed by folding a portion of said first side onto said second side, wherein at least two edges of the sheet are folded over, such edges being disposed on opposite sides of said sheet; each folded edge having a folding line;

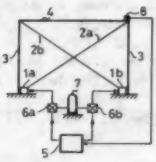
and said folding line of the folded over edges being predetermined by an associated open area.

4,964,246

RIGIDITY CONTROL SYSTEM FOR VARIABLE RIGIDITY STRUCTURE

Takuji Kobori; Hiroo Kanayama, and Shuichi Kamagata, all of Tokyo, Japan, assignors to Kajima Corporation, Tokyo, Japan

Filed Mar. 6, 1989, Ser. No. 319,657
Claims priority, application Japan, Mar. 7, 1988, 63-53068
The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.
Int. Cl.[5] E04B *1/98*
U.S. Cl. 52—1 **9 Claims**



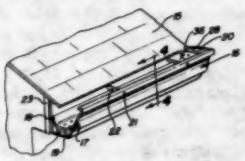
1. A rigidity control system for variable rigidity structures subjected to deformation forces due to vibration comprising vibration detecting means to detect and to signal the deformation of a structure in a first direction, to detect the rate of deformation of a structure in first direction, to detect the deformation of a structure in a second direction, and to detect the rate of deformation of said structure in said second direction; structure rigidity control means, and control means responsive to said signals from said detecting means for generating actuating control signals to said structure rigidity control means to attenuate deformation causing vibrations.

4,964,247

GUTTER SCREENING AND FLUSHING SYSTEM

Joseph P. Spica, Livonia, Mich., assignor to The 2500 Corporation, Farmington Hills, Mich.

Filed Mar. 20, 1989, Ser. No. 326,228
Int. Cl.[5] E04D *13/00*
U.S. Cl. 52—12 **16 Claims**



1. A gutter drain strip including:

(a) a platform portion having distal portions;

(b) a plurality of drain holes provided in said platform portion; and

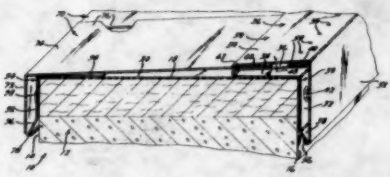
(c) a pair of legs integral with and downwardly depending from said platform portion, and being of a length succh that said platform portion is positioned within said gutter and located a distance spaced from the top of said gutter.

4,964,248

COPING ASSEMBLY FOR A NON-UNIFORM PARAPET WALL

Mark D. Braine; Ralph Kirby; Donald W. Schultz, all of Asheville; Richard G. Tuttle, Hendersonville; Nelson M. Ferg; John B. Hickman, both of Asheville, and William C. Webb, Arden, all of N.C., assignors to W. P. Hickman Company, Asheville, N.C.

Filed Jan. 25, 1990, Ser. No. 470,326
Int. Cl.[5] E04D *3/38*
U.S. Cl. 52—60 **38 Claims**



1. A coping assembly for a parapet wall on a building structure, the paratet wall having generally vertical inner and outer surfaces interconnected by a generally horizontal upper surface, said coping assembly comprising:

a clip member having a generally vertical clip leg for overlapping a portion of the vertical outer surface of the parapet wall, a generally horizontal clip leg for overlapping a portion of the horizontal surface of the parapet wall, and a resilently deflectable generally sloping clip leg extending transversely to said horizontal clip leg, said vertical slip leg having a lower hooked clip edge thereon, and said sloping clip leg having an upper hooked clip edge thereon;

clip attachment means for attaching said clip member to the parapet wall;

a fascia member having a generally vertical fascia leg and a generally horizontal fascia leg, said vertical fasica leg having a lower hooked fascia edge thereon for interlockingly engaging said lower hooked clip edge, and said generally horizontal fascia leg overlapping at least a portion of said sloping clip leg and having a generally downwardly-directed protrusion thereon for engaging said upper hooked clip edge in a snapped-on relationship therewidth after said lower hooked fasica edge and said lower hooked clip edge have been interlockingly engaged with one another;

a top plate member having a generally vertical plate leg for overlapping the vertical inner surface of the parapet wall and a generally horizontal plate leg for overlapping a portion of the horizontal surface of the parapet wall, said horizontal plate leg extending outwardly to overlap a portion of said resilient sloping clip leg and to underlap a portion of said horizontal fascia leg and being resiliently clampingly engaged therebetween when said fascia member is snapped onto said clip member in order to accommodate a variety of parapet wall widths between the generally verical inner and outer surfaces thereof; and

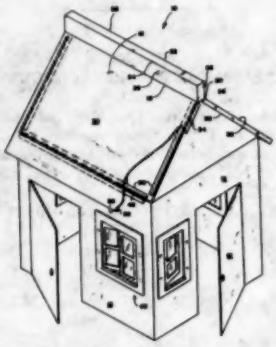
plate anchoring means for anchoring said top plate member to the parapet wall.

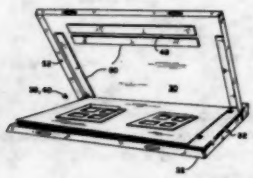
4,964,249

FOLDABLE PLAYHOUSE WITH CONTAINER-FORMING ROOF

Mark B. Payne, 4017 Ninth Ave., Huntsville, Ala. 35805

Filed Sep. 18, 1989, Ser. No. 408,373
Int. Cl.[5] E04B 7/16
U.S. Cl. 52—70 **8 Claims**





1. A foldable children's playhouse comprising:

a roof comprising a box beam and a pair of roof panels, said box beam including an elongated rectangular top member and a pair of rectangular side members, each side member having a lower edge and being connected to a side of said top member and disposed perpendicular thereto, and each of said roof panels being foldably secured to a side member along the lower edge thereof;

a pair of integral wall units each including a rectangular side wall and an end wall having a rectangular bottom wall portion and a generally triangular gable portion, said gable portion being foldable along a horizontal line at the juncture with said bottom wall portion;

means for securing adjoining said wall units to one another in assembled relation so as to provide a wall structure with right angles between walls;

means on the underside of said roof panels and spaced apart from edges thereof for receiving upper edges of said side walls and end gables in forced-fit relationship; and

said roof being adapted to form a storage receptacle for enclosing said wall units in folded, stacked relation therein.

4,964,250

MODULAR ACOUSTICAL PANEL AND METHOD OF MAKING SAME

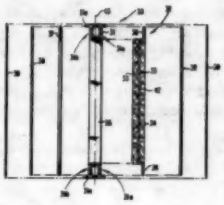
Thomas E. Nelson, Anchorage, Ky., assignor to Soltech, Inc., Shelbyville, Ky.

Filed Aug. 30, 1989, Ser. No. 400,740
Int. Cl.[5] E04B 1/82
U.S. Cl. 52—144 **17 Claims**

1. A modular acoustical panel for use in separating and dividing interior space comprises:

a frame member having a wall portion which surrounds and defines a core-receiving space; and

a modular septum attached to said frame member and including two layers of insulating material separated by an offset partition,



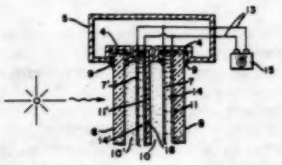
said offset partition including a center portion, an outer flange portion spaced apart from said center portion and an offset wall disposed between and connecting said center portion with said outer flange portion.

4,964,251

DUAL-PANE THERMAL WINDOW WITH LIQUID CRYSTAL SHADE

Ray H. Baughman, Morris Plains; Ernest D. Buff, Far Hills; Helmut Eckhardt, Madison, and Gerhard H. Ruchs, Far Hills, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 398,599, Aug. 25, 1989, which is a continuation of Ser. No. 350,808, May 12, 1989, which is a continuation of Ser. No. 66,299, Jun. 25, 1987. This application Oct. 23, 1989, Ser. No. 425,263
Int. Cl.[5] G02F 1/133
U.S. Cl. 52—171 **2 Claims**



1. A method for decreasing radiative and conductive heat transfer between the exterior and the interior of a building, comprising the steps of:

(a) mounting within a window frame a plurality of spaced window panes, a first and a second of said panes having opposing faces;

(b) affixing to one of the opposing faces a first wall of a liquid crystal cell, said first wall being composed of transparent, electrically conductive film to form a cavity containing an electro-optically responsive liquid crystal material providing a selected light transmittance; said film being composed of plastic; and said first and second walls having sufficient supporting strength to maintain the integrity of said cell;

(c) affixing to said other of said opposing faces a second wall of a liquid crystal cell, said wall of said second liquid crystal cell being affixed to substantially the entire portion of said other of said opposing faces and said first and second walls having sufficient supporting strength to maintain the integrity of the cell

(d) delimiting between said second wall of said cell and the other of said opposing faces of said panes a space providing a thermal break.

4,964,252

JOINING SYSTEM FOR JOINING WALL PANELS TO FORM A BOX-LIKE HOUSING

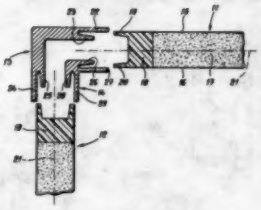
Hendrik J. Gulliker, Putten, Netherlands, assignor to Fokker Special Products B.V., Netherlands

Filed Oct. 24, 1989, Ser. No. 426,099

Claims priority, application Netherlands, Oct. 25, 1988, 8802624

Int. Cl.[5] E04B *1/00*

U.S. Cl. 52—275 9 Claims



1. A joining system for joining six wall panels to form a box-like housing such as a shelter, each panel having a rectangular flat shape and comprising a core of electrically non-conducting material bounded at the four edges by bifurcated edge sections and metal plates or layers bonded to said core and forming the inner and outer wall surfaces of the housing after joining the six panels, said bifurcated edge sections providing a groove in each edge, said grooves having groove walls and said groove walls extending at an angle in a manner such that each leg of the edge section together with the thereto bonded part of the respective metal plate or layer forms a wedge-shaped peripheral portion along the respective edge of the panel, the system furthermore comprising L-shaped frame sections of electrically conducting material of which the ends of both legs are provided with a groove whose cross-sectional shape is matched to the shape of the said wedge-shaped peripheral portions, said wall panels and said L-shaped frame sections being configured and dimensioned to be assembled in a box-like housing by positioning the wedge-shaped peripheral portions on each edge of the panels into the grooves in the ends of the legs of two of said L-shaped frame sections to obtain the general shape of the box-like housing and for the joints between the panel edges and the respective frame sections to be established by pressing each panel edge with force into the grooves of the respective L-shaped frame sections forming a rigid, continuous-contact joint.

4,964,253

MULTIPLE TRUSS HANGER CONNECTOR

William F. Loeffler, Bedford Heights, Ohio, assignor to Cleveland Steel Specialty Company, Maple Heights, Ohio

Filed Mar. 14, 1990, Ser. No. 493,350

Int. Cl.[5] E04B *1/00, 5/00, 1/32, 7/08*

U.S. Cl. 52—289 14 Claims

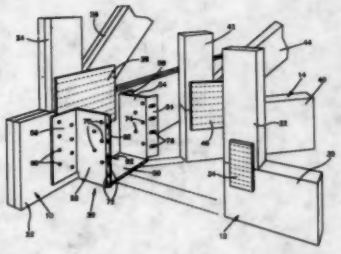
1. A single-piece, non-welded multiple truss metal hanger connector for connecting first and second supported wood members to a supporting wood member wherein one of said supported members is oriented at 90° with respect to said supporting member and the other said supported member is oriented at a skewed angle relative to said supporting member and said one supported member; said hanger connector comprising:

a single-piece metal structure having a flat seat for receiving said first and second supported members;

first and second supported member side flanges extending perpendicularly upward and parallel to each other from opposite side edges of said seat so as to form a U-shaped structure with each of said supported member side flanges adapted for flush mounting against one of said first and second supported members;

first and second supporting member end flanges extending perpendicularly from the rear edges of said first and second supported member side flanges, respectively, each of said end flanges having a flat surface adapted for flush mounting against said supporting member; and

first and second flange extensions extending outwardly from the forward edges of said first and second supported member flanges, respectively, each said extension extending outwardly at a skewed angle relative to its supported



member flange, the skewed angles being equal, each of said extensions adapted for flush mounting against one of said first and second supported members, whereby either one of said supported members may be received by said hanger connector and oriented at 90° from said supporting member and mounted flush against one of said supported member side flanges while the other one of said supported members is received by said hanger connector and oriented at said skewed angle and mounted flush against the flange extension extending at said skewed angle from the other one of said supported member side flanges.

4,964,254

CROSSPIECE SUPPORTING PAD IN STRUCTURAL CONSTRUCTION

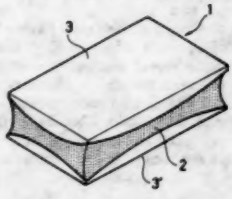
Hirokazu Fujii, Kyoto, and Fumio Yoshida, Osaka, both of Japan, assignors to Nitta Industries Corporation, Osaka, Japan

Filed Jun. 25, 1985, Ser. No. 748,681

Claims priority, application Japan, Jul. 26, 1984, 59-114373[U]

Int. Cl.[5] E04B *1/62*

U.S. Cl. 52—396 6 Claims



1. A crosspiece supporting pad in a structural construction member, comprising a resilient member having concavely spherical surfaces on its upper and lower sides, and a pair of rigid members each having a convexly spherical surface which mates with said concavely spherical surfaces, said concavely and convexly spherical surfaces each having apexes which are respectively provided above and below the apexes of the mating spherical surfaces, said rigid members bieng respectively fixed to the upper and lower sides of said resilient member with

their convexly spherical surfaces respectively held in mating relation with the concavely spherical surfaces of said resilient member.

4,964,255

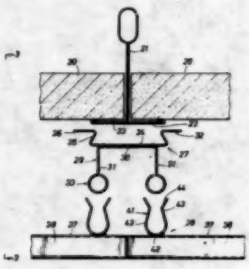
CEILING SYSTEM

Arthur C. Williams, Spring, Tex., assignor to Williams, Booth & Stewart, Houston, Tex.

Continuation-in-part of Ser. No. 247,967, Sep. 22, 1988, abandoned. This application Dec. 13, 1989, Ser. No. 450,265

Int. Cl.[5] E04B *9/04*

U.S. Cl. 52—489 **16 Claims**



1. In a ceiling system having an upper level of side-by-side, acoustical tiles supported along their bottom side edges by the exposed flanges of a grid of inverted, tee-shaped hangers, the improvement comprising

a plurality of first support members each comprising

an elongate, inverted, channel-shaped body,

clip means on the upper side of the base of the body and releasably attached to the opposite side edges of the flanges of an inverted tee, in response to upward movement of the clip means against the lower sides of the flanges, so as to releasably support the channel-shaped bodies from the tees in spaced apart, parallel relation, and

rod-shaped parts extending longitudinally along the lower ends of the depending legs of the body, and

a plurality of second support members each comprising

an elongate, substantially L-shaped body,

clip means on the upper side of one leg of the body and releasably attached to a rod-shaped part, in response to upward movement of the clip means against the rod-shaped part, so as to releasably support the L-shaped bodies from the channel-shaped bodies, in spaced apart, parallel relation, and

a flange extending inwardly along the end of the other leg of the body, and

a lower level of acoustical tiles each having kerfs formed in a first set of opposite edges thereof and in which the flanges of the adjacent pairs of spaced apart L-shaped bodies are received to support the tiles therefrom with said first set of edges of adjacent tiles near one another,

the clip means on the L-shaped bodies being slidable along the rod-shaped parts to dispose the other set of opposite edges of adjacent tiles near one another.

4,964,256

BEAM MEMBER FOR CONCRETE FORMING SYSTEM

Robert G. McCracken, Des Moines, Iowa, assignor to Economy Forms Corporation, Des Moines, Iowa

Filed Jan. 5, 1990, Ser. No. 461,352

Int. Cl.[5] E04C *3/30*

U.S. Cl. 52—726 **9 Claims**

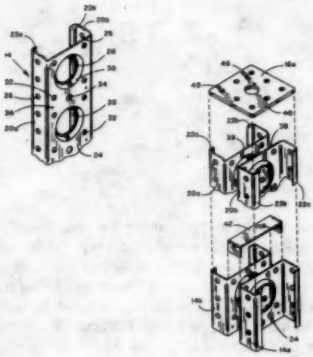
1. A method for fabricating a high-strength, light-weight beam from a sheet of metal material, comprising:

(a) forming from the sheet material a channel-shaped member having a pair of transversely opposite leg sections with inturned terminal edges and an interconnecting web section;

(b) providing a rectangular metal end plate for each end of the beam having a thickness greater than the thickness of the sheet material;

(c) foreshortening the terminal ends of said web section of said channel member by an amount substantially equal to about one-half the thickness of an end plate;

(d) positioning a pair of said channel members with the foreshortened web sections thereof in a back-to-back



spaced relation to provide a rectangular plate receiving area, of a size and shape of an end plate, having the corners thereof defined by said inturned terminal edges of said leg sections;

(e) locating an end plate within a plate-receiving area against said foreshortened web sections at the terminal ends thereof; and

(f) securing each end plate to a channel member by a weldment extended over the surfaces of said end plates exposed outwardly from beyond the leg sections of said channel members.

4,964,257

METHOD OF ASSEMBLING A PANEL ASSEMBLY

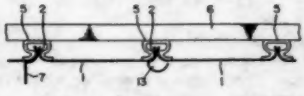
Kazutoshi Kurose, Kanagawa, Japan, assignor to Gomeigaisha Kurose & Co., Hiroshima, Japan

Division of Ser. No. 225,280, Jul. 28, 1988, Pat. No. 4,833,839. This application Mar. 13, 1989, Ser. No. 322,115

Claims priority, application Japan, Aug. 7, 1987, 62-197447; Apr. 12, 1988, 63-88059

Int. Cl.[5] E04B *5/55*

U.S. Cl. 52—741 **7 Claims**



1. A method of assembling a panel assembly characterized in that the first curved portion of an elastic first upper panel curved convexly outward at both the side edges thereof and extending in the transverse direction of the panel assembly is engaged with the first inner curved surface in a first pair of inner curved surfaces of a support provided with a large number of pairs of inner curved surfaces located at small intervals with one another on the top of the support and corresponding to the arc-shaped curves of upper panels; the elastic first upper

panel is pushed and deformed so that the second curved portion of the first upper panel is aligned and engaged with a second inner curved surface in a second pair of inner curved surfaces of the support; the first curved portion of an elastic second upper panel is then engaged with the first inner curved surface in a third pair of the inner curved surfaces of the support, which neighbors the first pair of inner curved surfaces; the second curved portion of the second upper panel is then placed on the second inner curved surface in the first pair of the inner curved surfaces of the support such that the second curved portion of the second upper panel comes into contact with the first curved portion of the first upper panel so that the second curved portion of the second upper panel cannot be engaged with the second inner curved surface in the first pair of inner curved surfaces by pushing on the second curved portion of the second upper panel; the second curved portion of the second upper panel is then engaged with the second inner curved surface in the first pair of the inner curved surfaces of the support by pushing the second upper panel downward at the intermediate part of the width thereof so that the elastic second upper panel is deformed and the tangent of the edge of the second curved portion of the second upper panel extends vertically and is inserted into a gap between the first curved portion of the first upper panel and the second inner curved surface of the first pair of inner curved surfaces of the support and so that upon insertion there is a mutual contact force between the first and second panels; repeating the above operation so as to assemble a plurality of upper panels; and inserting of a first support member, having an arc-shaped curve on an end thereof which coincides with the curved portions of each upper panel, in an opening between a pair of first and second curved portions of two adjacent assembled panels.

4,964,258

PACKAGING ARTICLE INCLUSION-PROOFING DEVICE FOR END-SEALING MECHANISM

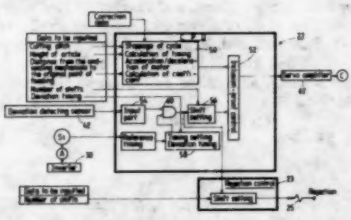
Kiyoshi Seko; Masato Hatano, and Shigeki Suzuki, all of Nagoya, Japan, assignors to Fuji Machinery Company Ltd., Nagoya, Japan

Filed Nov. 7, 1988, Ser. No. 267,945

Claims priority, application Japan, Apr. 26, 1988, 63-56097[U]

Int. Cl.[5] B65B *9/06, 57/16*

U.S. Cl. 53—75 **7 Claims**



1. A packaging article inclusion-proofing device for an end-sealing mechanism, comprising:

a first motor for driving a conveyor for feeding packaging articles with a predetermined amount of space defined therebetween into a packaging material which is delivered downstream and which is formed into a tube;

a second motor for driving a plurality of rolls which deliver said packaging material being formed into said tube;

a third motor for driving an end-sealing mechanism for achieving end-sealing of said tubular packaging material in a crosswise direction relative to said feeding of said packaging articles;

a deviation detecting sensor disposed at a predetermine deposition upstream of said end-sealing mechanism for detecting a predetermined amount of deviation of said packaging articles inserted within said tubular packaging material relative to the portion of said tubular packaging material to be end-sealed and for generating a signal indicative of said predetermined amount of detected deviation;

reference timing pulse generating means for generating predetermined reference timing pulse signals for the timing of said feeding of said packaging articles from said conveyor;

means for determining the coincidence between said deviation detection signal generated by said deviation detecting sensor and one of said reference timing pulse signals generated by said reference timing pulse generating means; and

means for stopping said third motor for driving said end-sealing mechanism under gradual deceleration conditions in response to a determination of coincidence by said coincidence determining means between one of said reference timing pulse signals generated by said reference timing pulse generating means and said deviation detection signal generated from said deviation detecting sensor, and for starting said third motor for driving said end-sealing mechanism, after a duration of time wherein said third motor is stopped for a number of cycles in which inclusion of deviated packaging articles by said end-sealing mechanism is expected to occur, under gradual acceleration conditions so as to gradually accelerate said third motor until the speed and phase thereof may be synchronized with those of said first motor for driving said conveyor and those of said second motor for feeding said packaging material.

4,964,259

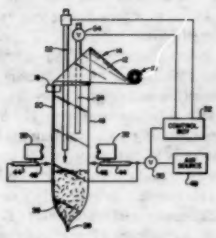
FORM-FILL-SEAL DEFLATION METHOD AND APPARATUS

Jon A. Ylvisaker, Marietta, and Louis R. Boston, Chittenango, both of N.Y., assignors to Borden, Inc., Columbus, Ohio

Filed Aug. 2, 1989, Ser. No. 388,820

Int. Cl.[5] B65B *9/08, 31/04, 51/30*

U.S. Cl. 53—433 **20 Claims**



1. A process for deflating a container, comprising,

forming a container with a closed bottom, sidewalls and an opening, the sidewalls being of gas impermeable and flexible material,

supplying the flexible material as a sheet and shaping said sheet into a tube with the longitudinal edges bonded together,

sealing the leading end of the tube to define said closed bottom of the container,

placing goods in the container through the opening,

directing a blast of air against the exterior surface of each sidewall to urge said sidewalls toward each other and thereby drive gas out of the container through said opening, the blasts of air being substantially equal to magnitude and opposite in direction to impinge only on the sidewalls above the level of the goods in the container,

sealing the opening to prevent the return of the gas to the container, the location of said blasts being below the level of said sealing.

stopping the blasts of air prior to said sealing of the opening.

4,964,260

PACKAGING MACHINE FOR CARDBOARD BOXES AND PROCESS FOR PACKAGING ARTICLES IN CARDBOARD BOXES

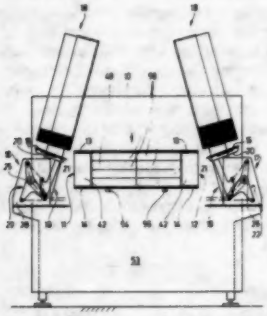
Heinz Focke, Verden, and Hugo Mutschall, Kirchlinteln, both of Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Apr. 13, 1989, Ser. No. 337,700

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1988, 3812688

Int. Cl.[5] B65B *7/20, 35/18, 61/20*

U.S. Cl. 53—467 **12 Claims**



1. A packaging machine for cardboard boxes made of a prefabricated blank, folded together flat, which is constructed to form a cardboard shell, polygonal in cross-section and open on two sides, set upright, filled and closed by folding over folding flaps comprising:

a magazine for cardboard inserts (15), at least one of said cardboard inserts at a time being insertable into the open cardboard shell (10);

at least one insert-transmitter (19) comprising an insert-holder (20) for taking a cardboard insert and inserting said cardboard insert in an upright position into said cardboard shell (10), said insert-transmitter (19) being movable by means of an operating rod, wherein said magazine (18) is arranged laterally above a conveying track for said cardboard shells (10), said cardboard inserts being held in said magazine (18), and are individually extractable from said magazine (18), said insert-transmitter (19) including means for extracting a cardboard insert from said magazine (18), pivoting said cardboard insert into an upright position and inserting said cardboard insert into said cardboard shell (10) by means of said insert-holder (20) of said insert transmitter (19) being movable from below via said operating rod to said magazine (18) for extracting said cardboard insert and being lowerable with the extracted cardboard insert, pivotable, and transversely movable in a direction of the open cardboard shell (10) for laterally inserting said cardboard insert.

4,964,261

BAG FILLING METHOD AND APPARATUS FOR PREPARING PHARMACEUTICAL STERILE SOLUTIONS

James A. Benn, 31 Fairmount Ave., Somerville, Mass. 02144

Filed Jan. 24, 1989, Ser. No. 301,506

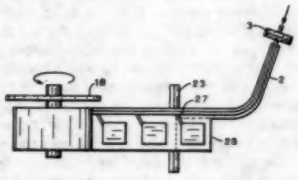
Int. Cl.[5] B65B *3/17, 3/16, 3/06*

U.S. Cl. 53—469 **21 Claims**

1. A method of packaging a sterile solution into a plurality of sterile, flexible bags of defined volume in a non-sterile atmosphere, which method comprises:

(a) providing a pre-sterilized bag set composed of a heat-sealable thermoplastic polymer, the bag set comprising a plurality of preformed, unfilled, individual bags of defined volume arranged in a sequentially connected series and adapted to be compactly stored in a unfilled condition, the bag set having a single inlet for the introduction of a sterile solution to be packaged and a single fill tube connected to the single inlet, the inlet tube extending generally the length of the bag set and a plurality of short, individual bag fill tubes extending from the single fill tube to be each of the individual bags of the bag set;

(b) compactly storing the bag set in a storage means;



(c) sequentially withdrawing from the compactly stored bag set, the individual bags;

(d) introducing a sterile solution of a defined volume into the single inlet of the bag set and through the fill tube sequentially into the individual fill tubes of the individual bags as withdrawn from the storage means;

(e) filling a defined volume of the sterile solution from the fill tube and through the individual fill tube into the withdrawn individual bag as withdrawn from the storage means;

(f) sequentially heat sealing the individual bag fill tube after the filling of the sterile solution; and

(g) removing from the bag set the individual, filled, sterile, heat-sealed, flexible bags.

4,964,262

MACHINE FOR FILLING AND CLOSING TWO-PIECE CAPSULES

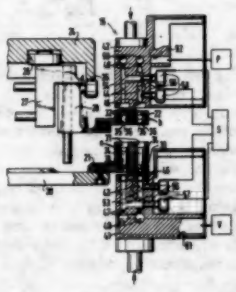
Theodor Moser, Steinenberg, and Eberhard Krieger, Weinstadt, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 11, 1989, Ser. No. 392,339

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1988, 3830013

Int. Cl.[5] B65B *57/06, 43/42*

U.S. Cl. 53—506 **8 Claims**



1. A machine for filling and closing two-piece capsules, each capsule having a bottom and a cap, comprising a plurality of

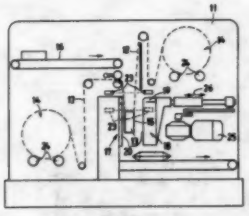
conveyor devices which are movable to different stations, circumferentially, each of aid conveyor devices including a plurality of first receptacles for receiving and supporting said capsule bottoms and a plurality of separate corresponding second receptacles for receiving and supporting said caps, said first and second receptacles surrounding said bottoms and caps, a testing apparatus for testing the presence of said bottoms and caps of said capsules in said first and second receptacles, said test apparatus including first and second test heads, each of said first and second test heads include a plurality of chambers that are movable into coincidence with said first and second receptacles, a first source of differential pressure that communicates with said first test head, a second source of differential pressure that communicates with said second test head, each receptacle of said plurality of first receptacles communicates via a throttle (47) with said first differential pressure source, each receptacle of said plurality of second receptacles communicates via a throttle (48) with said second differential pressure source, a separate pressure sensor that communicates with each receptacle of said pluralities of first and second receptacles, each pressure sensor (57, 58) produces an electrical output signal in accordance with a differential pressure applied thereto, and an electrical switching device that receives said output signals from each of said sensors and controls filling of said capsules.

4,964,263

PACKAGING MACHINE EQUIPPED WITH AN IMPROVED WELDING AND CUTTING DEVICE

Aris Ballestrazzi, and Lamberto Tassi, both of Savignano sul Panaro, Italy, assignors to Sitma, S.p.A., Spilamberto, Italy

Filed Feb. 24, 1989, Ser. No. 315,729
Claims priority, application Italy, Mar. 1, 1988, 19598 A/88
Int. Cl.[5] B65B *7/06, 51/22*
U.S. Cl. 53—555 **4 Claims**



2. A packaging machine for packaging products, comprising:

(a) product feeding means for delivering the product to the packaging machine;

(b) at least two bobbins connected to the packaging machine wherein said bobbins having packaging material, and wherein said packaging material is unwound and supported from said bobbins for forming a cradle shape for receiving the product;

(c) sensor means for controlling the unwinding of said packaging material from said bobbins;

(d) welding and cutting means including blade and counterblade elements respectively moveable to each other for simultaneously making at least one transverse welding and at least two longitudinal weldings for sealing said packaging material around the product for forming a sealed package wherein said sealed package has end portions, and simultaneously cutting off said end portions from said sealed package, wherein said blade and said counterblade elements further comprise an upper horizontal portion which is transversely positioned relative to said packaging material and at least two longitudinal side portions perpendicularly depending from said upper horizontal portion and omega shaped elements for operatively connecting said longitudinal side portions with said upper horizontal portion;

(e) motor means for reciprocatingly moving said welding and cutting means; and

(f) a sucking element connected to the machine and located proximate to said blade and counterblade elements for sucking said cut end portions away from said sealed package.

4,964,264

PROTECTIVE EAR BAGS FOR DOGS

Depy P. Adams, 2019 Ferncliff Rd., Charlotte, N.C. 28211

Filed Jan. 22, 1990, Ser. No. 467,924
Int. Cl.[5] B68B *5/00*
U.S. Cl. 54—80 **5 Claims**

1. An ear covering for protecting the ears of longeared dogs during eating, comprising:

(a) first and second ear-sized bags having first and second sides closed on three side edges and open on a fourth side edge; and

(b) elongate connector means having first and second opposed ends, said first end for being attached to one of said first and second sides adjacent said open side edge and said second end for being attached to the other of said first and second sides adjacent said open side edge;

said elongate connector means adapted for extending across and suspending said first and second bags from the top of the dog's head, with the dog's ears releasably positioned in said first and second bags and removable by the dog shaking its head, and said ear covering being free of holding means for extending under or around the head or neck of the dog whereby the ear covering is held on the dog only by the connector means extending across the top of the dog's head and the weight of the dog's ears in the first and second bags.

4,964,265

REMOTELY CONTROLLED LAWN MOWER

Carl W. Young, P.O. Box 150, Isola, Miss. 38754

Filed Sep. 11, 1989, Ser. No. 405,139
Int. Cl.[5] A01D *34/78;* **B62D** *5/04*
U.S. Cl. 56—10.8 **13 Claims**

1. A remotely controlled, self-propelled lawn mower comprising:

(a) a frame;

(b) means carried by said frame for cutting a lawn;

(c) a radio transmitter with plural channels for transmitting signals, said signals directing movement of said lawn mower;

(d) a radio receiver with plural channels carried by said frame for receiving the signals from said transmitter;

(e) a first pair of ground engaging wheels carried by the forward portion of said frame, one each on stub axles, and selectively positioned with respect to said frame for steering said lawn mower;

(f) a second pair of ground engaging wheels carried by the rear portion of said frame in a predetermined position with respect thereto for propelling said lawn mower;

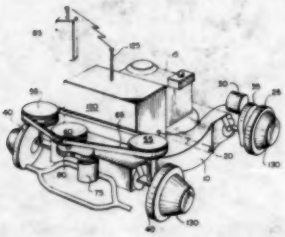
(g) first and second direct current electric motors, each for imparting forward and reverse rotary motion and variable velocity to one of said second pair of wheels; said motors being operatively connected to said receiver and responsive to signals received from said transmitter on a first one of said plural channels;

(h) a third direct current electric motor for positioning said first pair of wheels with respect to said frame, said third motor being operatively connected to said receiver and responsive to signals received from said transmitter on a second one of said plural channels;

(i) a battery for providing power to said three motors and to said receiver;

(j) three pulley means connected by a belt,

a first one of said three pulley means being carried by the forward portion of said frame between said first pair of wheels and operatively connected to said third motor,



the second and third ones of said three pulley means being operatively connected to one each of said stub axles to control the position of said first pair of wheels relative to said frame,

each of said stub axles having one of said first pair of wheels at one distal end and one of said second and third pulleys at the other distal end, and having a shape so that rotary motion of said one pulley effects circumferential movement of said one wheel about said one pulley,

whereby movement of said belt responsive to said third motor effects the rotation of said second and third pulley means to steer the mower; and

(k) four frustro-conical protectors, each carried by and projecting outwardly from one of said wheels, for inhibiting the loss by said lawn mower of four-point contact with the ground in the event of uneven terrain.

4,964,266

LAWNMOWER WITH GRASS COLLECTION CONTAINER

Walter Kolb, Betzdorf, Fed. Rep. of Germany, assignor to Wolf-Gerate GmbH, Fed. Rep. of Germany

Filed May 25, 1988, Ser. No. 198,564

Claims priority, application Fed. Rep. of Germany, May 29, 1987, 3718096

Int. Cl.[5] A01D *34/70*

U.S. Cl. 56—202 **20 Claims**

1. A system for cutting and collecting grass, comprising:

(A) a lawnmower, comprising:

(a) cutting means for cutting grass; and

(b) a frame;

(B) a grass collection container removably attached to said frame of said lawnmower, said grass collection container comprising:

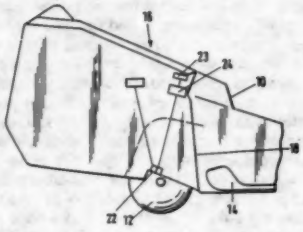
(a) a main portion;

(b) a bottom side; and

(c) an entry mouthpiece in the vicinity of said bottom side, said entry mouthpiece being between said cutting means of said lawnmower and said main portion;

(C) means for conveying cut grass from said cutting means, through said entry mouthpiece, and into said main portion of said grass collection container;

(D) a sensor for directly sensing the presence of cut grass filling the entry mouthpiece of the grass collection container;



(E) an indicator operatively connected to said sensor for indicating the level of grass in said container responsive to the characteristic sensed by said sensor.

4,964,267

METHOD AND APPARATUS FOR PIECING A RESERVE FEED STOCK WITH A PRODUCTION FEED STOCK

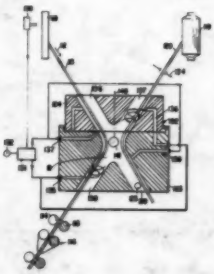
Peter Oehy; Daniel Brennwalder, and Othmar Bachmann, all of Winterthur, Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Division of Ser. No. 211,534, Jun. 24, 1988, abandoned. This application Oct. 25, 1989, Ser. No. 426,281

Claims priority, application Switzerland, Jun. 24, 1987, 377/87-1

Int. Cl.[5] D01H *15/00*

U.S. Cl. 57—22 **13 Claims**



1. A method of piecing a reserve roving to a production roving located in an operating position, on textile machines comprising the steps of:

(a) bringing a reserve roving into a stand-by position;

(b) imparting an increasing twisting force to a first roving section of each of the production roving and the reserve roving to form a substantially parallel orientation of the fibers in a second roving section adjacent to the first roving section of each said production roving and said reserve roving;

(c) severing the production roving and the reserve roving in the second roving section of each said production roving and said reserve roving;

(d) suddenly removing the increasing twisting force, thus causing roving end sections of both the production roving and the reserve roving to decrease their twist and simultaneously bringing together said roving end sections so that both said roving end sections join to one another; and

(e) bringing the reserve roving into the operating position.

4,964,268

PROCESS AND AN ARRANGEMENT FOR THE PIECING OF A DOUBLE YARN AFTER A YARN BREAKAGE

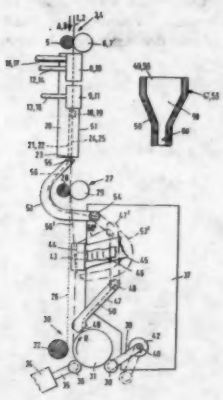
Fritz Stahlecker, Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker, Suessen, Fed. Rep. of Germany, a part interest

Filed Aug. 8, 1989, Ser. No. 390,752

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1988, 3828189

Int. Cl.[5] D01H *1/115, 15/013*

U.S. Cl. 57—261 16 Claims



1. A process for piecing newly spun double prestrengthened yarn being supplied by a spinning unit to previously spun double prestrengthened yarn on a spool package or the like, comprising the sequential steps at the spinning unit of:

providing strengthening twisting to both the newly spun and the previously spun double yarn ends, and

subsequently splicing the newly spun and previously spun double yarn ends together,

whereby the strengthening twisting facilitate handling of the yarn ends for the subsequent splicing operation at the spinning unit.

4,964,269

APPARATUS FOR TRANSPORTING SPINNING TUBES TO AND FROM A TEXTILE SPINNING MACHINE

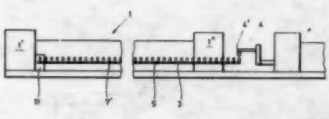
Friedrich h Dinkelmann, Rechberghausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Fed. Rep. of Germany

Filed Apr. 11, 1989, Ser. No. 336,242

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1988, 3812342

Int. Cl.[5] D01H *15/00*

U.S. Cl. 57—281 6 Claims



1. Apparatus for transporting spinning tubes along a textile spinning machine having spinning stations along two opposite longitudinal sides thereof for use in supplying empty spinning tubes thereto and removing fully-wound spinning tubes therefrom, said apparatus comprising an endless flexible metal belt having a generally flat lateral extend, a plurality of spinning tube transport members mounted on said belt at spacings therealong, spinning tube support means associated with said tube transport members, means for guiding said belt for travel in a continuous operating path extending along each opposite longitudinal side of said spinning machine and transversely between the opposite longitudinal sides at the ends of said spinning machine with said generally flat lateral extent in generally upstanding relation facing said spinning machine, and drive means for actuating traveling movement of said belt, said transport members and said support means being cooperatively arranged for transporting in spaced relation along the two opposite longitudinal sides of said spinning machine a plurality of spinning tube support plates each adapted for removably carrying a spinning tube and for automatically releasing the plates at each location in said operating path of said belt whereat the direction of traveling movement of said belt changes from one longitudinal side of said spinning machine to travel transversely to the other longitudinal side of said spinning machine.

4,964,270

GAS TURBINE ENGINE FUEL SYSTEM

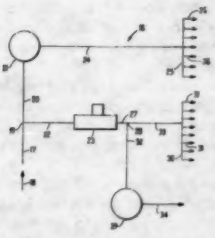
David H. Taylor, Warwick, and Michael R. Lyons, Leicester, both of England, assignors to Rolls-Royce plc, London, England

Filed May 17, 1989, Ser. No. 352,953

Claims priority, application United Kingdom, May 27, 1988, 8812588

Int. Cl.[5] F02C *7/232, 7/26*

U.S. Cl. 60—39.094 6 Claims



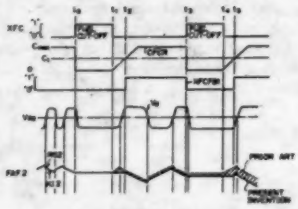
1. A gas turbine engine fuel system comprising a source of pressurized fuel, main and starter fuel manifolds interconnected with and adapted to receive fuel from said source of pressurized fuel, means interconnecting each of said manifolds with the interior of the combustion apparatus of a gas turbine engine and adapted to direct fuel into said combustion apparatus interior, valve means adapted to optionally interrupt the fuel supply to said starter fuel manifold, and a drains system means being provided to interconnect said starter fuel manifold with a drains system, said drains system being arranged to be at a pressure lower than that operationally within said combustion chamber, whereby when, during engine operation, said fuel flow to said starter manifold is interrupted by said valve means, pressurized gases originating from within said combustion equipment flow through and thereby purge said starter manifold and said means interconnecting said starter manifold and said combustion apparatus, and exhaust into said drains system through said means interconnecting said starter manifold and said drains system, flow limiting means being provided in said means interconnecting said starter manifold and said drains system to at least limit the amount of fuel flowing into said drains system when said fuel supply to said starter manifold is not interrupted by said valve means.

4,964,271

AIR-FUEL RATIO FEEDBACK CONTROL SYSTEM INCLUDING AT LEAST DOWNSTREAM-SIDE AIR-FUEL RATIO SENSOR

Hiroshi Sawada, Gotenba; Tatehito Ueda, Susono; Kiyoshi Nakanishi, Susono, and Takayuki Densura, Mishima, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 3, 1988, Ser. No. 163,871
Claims priority, application Japan, Mar. 6, 1987, 62-50325; Mar. 6, 1987, 62-50326
Int. Cl.[5] F02D *41/14*
U.S. Cl. 60—274 30 Claims



1. A method for controlling an air-fuel ratio in an internal combustion engine having a catalyst converter for removing pollutants in the exhaust gas thereof, and upstream-side and downstream-side air-fuel ration sensors disposed upstream and downstream, respectively, of said catalyst converter, for detecting a concentration of a specific component in the exhaust gas, comprising the steps of:

sensing air-fuel ration feedback control conditions for said downstream-side air-fuel ration sensor;

determining whether or not all the air-fuel ratio feedback control conditions for said downstream-side air-fuel ratio sensor are satisfied;

controlling the air-fuel ration of said engine by an open loop control so that it is brought close to an air-fuel ratio, when at least one of the air-fuel ratio feedback control conditions for said downstream-side air-fuel ratio sensor is not satisfied;

controlling the air-fuel ratio of said engine in accordance with the output of said upstream-side air-fuel ratio sensor so that it is brought close to the stoichiometric air-fuel ratio while prohibiting control of said air-fuel ratio of said engine in accordance with the output of said downstream-side air-fuel ratio sensor for a period after all the air-fuel ratio feedback control condition for said downstream-side air-fuel ratio sensor are satisfied; and

controlling the air-fuel ratio of said engine in accordance with the outputs of said upstream-side and downstream-side air-fuel ratio sensors so that it is brought close to the stoichiometric air-fuel ratio after said period has passed.

4,964,272

AIR-FUEL RATIO FEEDBACK CONTROL SYSTEM INCLUDING AT LEAST DOWNSTREAMSIDE AIR-FUEL RATIO SENSOR

Nobuaki Kayanuma, Gotenba, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

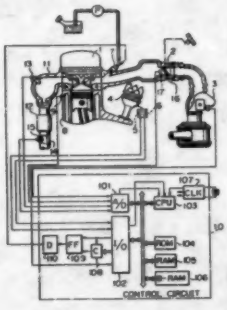
Filed Jul. 18, 1988, Ser. No. 220,790
Claims priority, application Japan, Jul. 20, 1987, 62-179173
Int. Cl.[5] F02D *41/14*
U.S. Cl. 60—274 32 Claims

1. A method for controlling an air-fuel ratio in an internal combustion engine having a catalyst converter for removing pollutants in the exhaust gas thereof, and upstream-side and downstream-side air-fuel ratio sensors disposed upstream and downstream, respectively, of said catalyst converter, for detecting a concentration of a specific component in the exhaust gas, comprising the steps of:

determining whether said engine is in an air-fuel ratio feedback control state for a stoichiometric air-fuel ratio by said downstream-side air-fuel ratio sensor or in an open loop control state for said upstream-side and downstream-side air-fuel ratio sensors;

calculating an air-fuel ratio correction amount in accordance with outputs of said upstream-side and downstream-side air-fuel ratio sensors when said engine is in said air-fuel ratio feedback control state;

determining whether or not a switching from the rich side to the lean side and a switching from the lean side occurs at an output of said downstream-side air-fuel ratio sensor;



changing the air-fuel ratio correction amount in accordance with the output of said upstream-side and said downstream-side air-fuel ratio sensors;

increasing the speed of change of said air-fuel ratio correction amount in accordance with the output of said downstream-side air-fuel ratio sensor for a predetermined time after a switching occurs in the output of said downstream-side air-fuel ratio sensor only the first time after said engine is switched from said open loop control state to said air-fuel ratio feedback control state; and

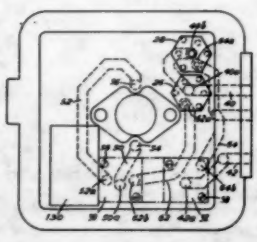
adjusting an actual air-fuel ratio in accordance with said air-fuel ratio correction amount.

4,964,273

SUBPLATE-MOUNTED CONTROL VALVES IN CONVERTIBLE OSCILLATOR DRIVE SYSTEM

John V. Nash, Boundstone, England, assignor to Kinetrol Limited of Trading Estate, Farnham, United Kingdom

Filed Oct. 13, 1988, Ser. No. 257,069
Claims priority, application United Kingdom, Oct. 14, 1987, 87 24066
Int. Cl.[5] F01C *9/00*; F04B *39/12*; F15B *13/044, 15/26*
U.S. Cl. 60—325 16 Claims



1. Control means for a fluid-operated actuator having actua-

tor porting for the admission of pressure fluid, said means comprising:

(a) a control unit,

(b) fluid supply connection means in said control unit,

(c) operating porting on said unit for connection with the actuator porting for a flow of fluid from said supply connection means to operate the actuator,

(d) said unit having an adaptor mounting face into which said operating porting opens,

(e) valve means comprising a plurality of similar power-operated valves in the control unit for controlling said flow of fluid from the supply connection means,

(f) said valves each having a mounting face and a series of fluid ports in said face,

(g) a plurality of adaptor devices having (i) a pair of mating faces and (ii) a plurality of conduits extending between and opening into said mating faces,

(h) said adaptor devices each having a different arrangement of said conduits and each said device being selectively and alternatively assembled with said control unit and valve means,

(i) means for detachably securing a selected one of said adaptor devices to the control unit with one of said mating faces against the adaptor-mounting face of the unit to place operating porting in communication with the porting in said one mating face, and

(j) means for attaching said valves to the selected adaptor device with their mounting faces against the other of said mating faces of the selected adaptor device to place said valve ports in communication with the conduits of the adaptor device, whereby a pattern of connection between the operating porting and valve fluid ports is determined by the selection of the adaptor device so as to provide alternative forms of control for said actuator.

4,964,274

HYDRAULIC PRESSURE GENERATOR

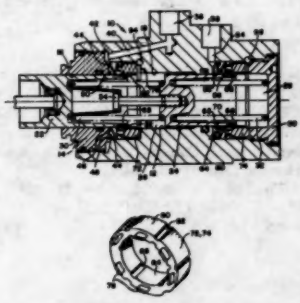
Juan S. Bacardit, Barcelona, Spain, assignor to Bendix Espana, Barcelona, Spain

Filed Oct. 19, 1988, Ser. No. 259,645

Claims priority, application European Pat. Off., Oct. 19, 1987, 87500066.3

Int. Cl.[5] B60T *11/26*; F15B *7/10*

U.S. Cl. 60—588 **8 Claims**



1. A hydraulic pressure generator comprising a body in which is formed a bore, at least one piston slideably mounted in the bore, annular sealing means located in the bore, the piston slideable, from a rest position, during operation of the generator to cooperate with the sealing means to divide the bore into a working chamber connectable by an output passage to a hydraulic actuator, and a refill passage connectable to a source of hydraulic fluid, the output passage being formed in part between a first surface fixed in the bore and a second surface formed on a short axial length ring mounted in the bore in the working chamber, an inner surface of the ring being dimensioned to receive the piston when the piston moves from the rest position, wherein the output passage opens into the bore adjacent the piston when the piston is in the rest position.

4,964,275

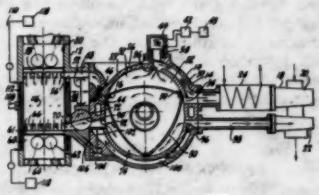
MULTICYLINDER COMPOUND ENGINE

Marius A. Paul, and Ana Paul, both of 1100 E. Orangethorpe Ave., Ste. 140, Anaheim, Calif. 92801

Division of Ser. No. 132,017, Dec. 14, 1987, Pat. No. 4,843,821. This application May 15, 1989, Ser. No. 352,055

Int. Cl.[5] F02B *33/36*

U.S. Cl. 60—605.1 **12 Claims**



1. A compound, rotary-reciprocal engine comprising:

a two-cycle reciprocator having a plurality of cylinders, each cylinder having at least one piston arranged for reciprocation in the cylinder in a cycled operation with a timed air input to the cylinder and a timed exhaust from the cylinder;

a compressed air intake and combustion gas exit in each cylinder of the reciprocator;

fuel injection means for injecting fuel into the cylinders at appropriate times in the cycled operation; and,

a rotocharger which comprises:

a positive displacement, periodic, rotary compressor-expander having a housing containing a rotor means rotated by combustion gases for compressing air in a periodic cycled operation, the housing including at least one air intake passage and at least one air exit passage, the rotor means being arranged to compress air entering the intake passage with the compressed air exiting the air exit passage in multiple periods during each cycle of operation, and including combustion gas intake and exit passages, the rotor means being arranged for periodic cycled rotation by expanding combustion gases entering the combustion gas intake passage and exiting the combustion gas exit passage in multiple periods during each cycle of operation;

wherein the two-cycle reciprocator is coupled to the positive displacement rotary compressor-expander with the air exit passage of the compressor-expander connected to the compressed air intake of the reciprocator with timed delivery of compressed air charges to each cylinder of the reciprocator, and the combustion gas intake passage of the compressor-expander connected to the combustion gas exit of the reciprocator with timed intake of exhausted combustion gases from each cylinder of the reciprocator;

wherein the rotary-reciprocal engine includes connecting means for connecting the two-cycle reciprocator to the positive displacement rotary compressor-expander with the cycled operation of the reciprocator timed with the cycled operation of the rotocharger for an integrated cycle operation with select cylinders of the reciprocator being in sequential periodic communication with the rotocharger during each period of the cycled operation of the rotocharger for timed delivery of compressed air to the cylinder and timed receipt of combustion gases from the cylinder that substantially matches the timed air input to the cylinder and the timed gas exhaust from the cylinder; and,

wherein the compressor-expander is of epitrochoidal configuration with a compression chamber and an expansion

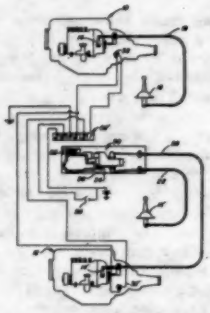
chamber each having a volume displaced by the rotor means on rotation of the rotor means, the compression chamber having the air intake passage located at one end of the compression chamber and the air exit passage located at the other end of the compression chamber, wherein air entering the air intake passage is compressed by displacement of the rotor means as the compressed air is transported to the air exit passage by rotation of the rotor means, the expansion chamber having a combustion gas intake passage located at one end of the expansion chamber and a combustion gas exit passage located at the other end of the expansion chamber, wherein combustion gases entering the combustion gas intake passage are expanded displacing the rotor means as the combustion gases are transported to the combustion gas exit passage by rotation of the rotor means, the compressor-expander including further, a bypass passage located around the expansion chamber connecting the combustion gas intake passage and the combustion gas exit passage.

4,964,276

ENGINE SYNCHRONIZER

H. D. Sturdy, Wilmington, N.C., assignor to Sturdy Corporation, Wilmington, N.C.

Filed Apr. 12, 1989, Ser. No. 336,970
Int. Cl.[5] F01B *21/04*
U.S. Cl. 60—700 **4 Claims**



1. A synchronizer for controlling the speed of a slave engine in accordance with the speed of a master engine, said synchronizer comprising:

adjustable speed control means for adjusting the speed of the slave engine,

a master engine speed signal generator for generating an electrical master speed signal,

a slave engine speed signal generator for generating an electrical slave speed signal,

circuit means coupled with said signal generators for producing a correction signal corresponding to the difference between the engine speeds,

a movable manual actuator for adjusting said adjustable speed control means,

a servo actuator coupled with said circuit means and being movable in response to said correction signal for adjusting said adjustable speed control means,

transfer means for selectively transmitting movement of said manual actuator or said servo actuator to said adjustable speed control means,

selector means for selecting which of said actuators transmits movement to said adjustable speed control means,

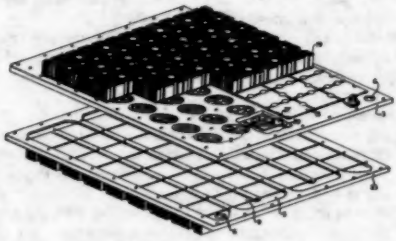
and means for holding said manual actuator in a predetermined throttle position when said servo actuator is selected and means for holding said servo actuator in a predetermined throttle position when said manual actuator is selected.

4,964,277

PLASTIC WATER BOX FOR A THERMOELECTRIC AIR CONDITIONER

William P. Blankenship, Carnegie; Robert Ritter, Pleasant Hills, and Phillip F. Schmitten, N. Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 5, 1990, Ser. No. 461,574
Int. Cl.[5] F25B *21/02*
U.S. Cl. 62—3.2 **20 Claims**



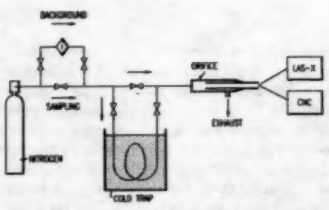
1. A thermoelectric air conditioner having a plastic water box and a plurality of first and second heat transfer plates separated by a plurality of semiconductor pellets, said water box comprising a first fiber reinforced plastic plate having a groove disposed in one side thereof with a plurality of openings disposed in said groove for receiving said first heat transfer plates with a plurality of said semiconductor pellets soldered thereto and a sealant disposed between said first plastic plate and first heat transfer plates adjacent the periphery of said openings, said second heat transfer plates being disposed on the side of said first plastic plate without the groove and in contact with said semiconductor pellets and a second fiber reinforced plastic plate cooperating with said first plastic plate to form a water box that electrically and thermally isolates the first and second heat transfer plates and provides a closed channel for heat rejection fluid.

4,964,278

METHOD OF SEPARATING CONDENSIBLE VAPORS FROM PARTICLES IN HIGHLY COMPRESSED GASES

Horng-Yuan Wen, Brookfield; Hwa-Chi Wang, Downers Grove, and Stephen Chesters, Chicago, all of Ill., assignors to American Air Liquide, Countryside, Ill.

Filed Mar. 6, 1989, Ser. No. 318,828
Int. Cl.[5] B01D *8/00*
U.S. Cl. 62—55.5 **7 Claims**



1. A process for removing condensible vapor from a compressed gas containing condensible vapors and particles with-

out affecting the spectra or concentration of said particles in said compressed gas, said process comprising:

(i) passing a starting compressed gas containing condensible vapors and particles through a flow system comprised of simple geometries and polished, clean surfaces;

(ii) selecting (iia) a compressed gas flow rate through said flow system and (iib) a flow system geometry, such that particles having a diameter greater than 0.01 μm have a collision efficiency of less than 5% with said flow system surfaces and condensible vapor molecules have a collision efficiency of at least 98% with said flow system surfaces;

(iii) controlling the temperature of least a portion of the surfaces of said flow system to retain collided vapor molecules on said portion of the surfaces; and

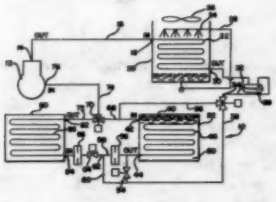
(iv) obtaining a product compressed gas free of condensible vapors and containing the spectra and concentration of particles of said starting compound gas.

4,964,279

COOLING SYSTEM WITH SUPPLEMENTAL THERMAL STORAGE

William T. Osborne, Anne Arundel, Md., assignor to Baltimore Aircoil Company, Jessup, Md.

Filed Jun. 7, 1989, Ser. No. 629,660
Int. Cl.[5] F25D *3/00*
U.S. Cl. 62—59 **8 Claims**



1. A method of cooling air

comprising the steps of passing a working fluid through a compressor means,

then passing the working fluid through a condenser means,

then passing the working fluid through a receiver means,

then operating in one of three modes, wherein the first mode includes the further steps of passing the working fluid as a liquid from the receiver means through an expansion device to form a gas-liquid two-phase mixture of the working fluid, and then passing the two-phase mixture through an evaporator means to cool air passing through the evaporator means and change the working fluid into a gas and then passing the working fluid back to the compressor means,

wherein the second mode includes the further steps of passing the working fluid as a liquid from the receiver means through an expansion device and then into tubing passing through thermal storage means to freeze a phase change material therein and change the working fluid to gas and then passing the working fluid back to the compressor means,

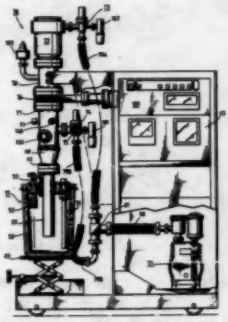
and wherein the third mode includes the further steps of passing the working fluid as a liquid from the receiver means through the tubing in a thermal storage means having a frozen phase change material therein to further chill the working fluid liquid in the coil by melting said phase change material, passing the working fluid liquid through an evaporator means to cool air passing through the evaporator means and change the working fluid into a gas and then passing the working fluid gas back to the compressor means.

4,964,280

METHOD AND APPARATUS FOR CRYOPREPARING BIOLOGICAL TISSUE

Carmen Piunno, The Woodlands, Tex.; Stephen Livesey, Victoria, Australia; John G. Linner, The Woodlands, Tex.; Anthony A. del Campo, Houston, Tex., and Mark J. Zaltzberg, The Woodlands, Tex., assignors to Board of Regents

Filed Aug. 17, 1989, Ser. No. 395,028
Int. Cl.[5] F24F *3/16*
U.S. Cl. 62—78 **30 Claims**



1. An apparatus for distillation drying of one or more biological samples comprising:

(a) a retaining assembly adapted to retain one or more biological samples;

(b) a vacuum assembly removably attached to said retaining assembly, said vacuum assembly including one or more vacuum pumps, at least one of said vacuum pumps being a low hydrocarbon, high vacuum pump;

(c) cooling means functionally associated with said retaining assembly, said cooling means being functionally effective to control the temperature of the component particles within said one or more tissue samples;

(d) monitoring means functionally attached to said retaining assembly, said monitoring means including one or more sensors to measure the temperature within at least a portion of the retaining assembly; and

(e) control means to activate and control said vacuum means and said monitoring means.

4,964,281

LOW-TEMPERATURE SHOWCASE

Tsutomu Tanaka, Oizumi, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Sep. 29, 1989, Ser. No. 415,092
Claims priority, application Japan, Oct. 6, 1988, 63-252393
Int. Cl.[5] A47F *3/04*
U.S. Cl. 62—256 **7 Claims**

1. A low-temperature showcase comprising:

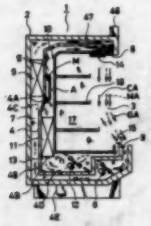
a case main body having at one side thereof an inlet-outlet opening for commodities and including an inner wall; an outer wall and a partition wall defining between the inner and outer walls an inner passage and an outer passage for passing air therethrough, the partition wall having a window at a portion thereof between two heat exchangers;

the two heat exchangers disposed in the inner passage and the outer passage respectively for providing refrigeration cycles along with a compressor, a condenser and reducing valves, the heat exchanger in the inner passage being positioned upstream of and at a predetermined distance

from the heat exchanger in the outer passage with respect to the same direction of air flow in each of said passages;

a blower disposed in each of the inner and outer passages respectively for passing air through the two passages in a first direction and adapted to form at least a double air curtain at the inlet-outlet opening with the air circulated through the inner and outer passages when at least the heat exchanger in the inner passage is operated for refrigeration;

passage change-over means for opening or closing the window in the partition wall; and



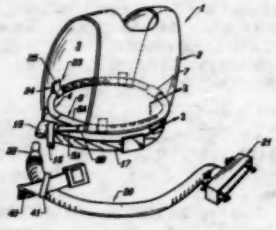
control means for providing passage change-over means instructions to open the window and controlling the operation of each of the two blowers when the heat exchanger in the inner passage is operated for defrosting and the heat exchanger in the outer passage is operated for refrigeration to direct a part of the air passing through the outer passage to flow through the open window into the heat exchanger in the inner passage in a second direction reversed to the first direction of air flow during the operation of the heat exchanger in the outer passage for refrigeration.

4,964,282

DETACHABLE BULLETPROOF VEST AIR CONDITIONING APPARATUS

Christopher S. Wagner, 1525 Kelly Park Cir., Morgan Hill, Calif. 95037

Filed Dec. 7, 1989, Ser. No. 447,236
Int. Cl.[5] F25D *23/12*
U.S. Cl. 62—259.3 **13 Claims**



1. An air cooling apparatus for cooling a bulletproof vest having a front panel section and a rear panel section comprising:

a first and a second hollow tubular member, each of said members having a plurality of holes in the upper wall thereof for permitting air to be discharged therefrom;

means for removably attaching said first tubular member to said front panel section and said second tubular member to said rear panel section of said bulletproof vest;

first means for detachably coupling said first and said second tubular members together; and

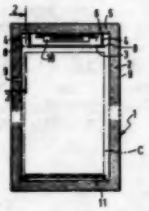
second means including a flexible hose means for detachably coupling said first and said second tubular members to a source of cooling air, said second means including means for automatically disengaging said first and said second tubular members from said hose means when said first and said second tubular members are pulled away from said hose means.

4,964,283

ISOTHERMAL CONTAINER WITH RESERVOIR FOR REFRIGERANT AND ITS USE FOR THE TRANSPORTATION OF FRESH PRODUCTS

Claude Gibot, Malakoff, France, assignor to Carboxyque Francaise, Puteaux, France

Filed Apr. 10, 1989, Ser. No. 335,677
Claims priority, application France, Apr. 8, 1988, 88 04659
Int. Cl.[5] F25D *3/12*
U.S. Cl. 62—384 **10 Claims**



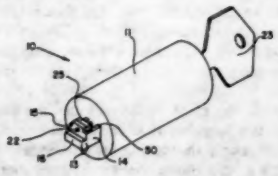
1. An isothermal container having isothermal walls defining an inner cavity partitioned by a thermally insulating baffle means into an upper chamber having a top wall and a lower chamber adapted to receive at least one service compartment having outer transverse dimensions substantially less than the corresponding inner transverse dimensions of said lower chamber, said baffle means being suspended from said top wall of said upper chamber and being so dimensioned to define a passage peripherally about said baffle means establishing a free communication between said upper and lower chambers, and means on said top wall of said upper chamber for supporting a refrigerant reservoir of a thermally conducting material, said reservoir having a bottom and so dimensioned to leave free between said bottom and said baffle means a region suitable for gas heat exchange by natural convection.

4,964,284

TELEPHONE LOCK

Denis McDaid, 25 O'Connor Court, Ballymagroarty, Derry, Ireland

Filed Dec. 15, 1989, Ser. No. 451,216
Claims priority, application Ireland, Oct. 16, 1989, 3328/89
Int. Cl.[5] E05B *73/00*
U.S. Cl. 70—14 **5 Claims**



1. A telephone lock for preventing the plug of a telephone from being inserted into a corresponding line jack unit, comprising a locking means including a shank member of a suitable length and size to be accommodated in a socket of the line jack

unit in substitution for a telephone plug proper, a movable latch plate mounted adjacent to a free end of the shank member, the latch plate being connected to the locking means by an elongate rotatable pin which passes through an aperture in the latch plate, such that upon operation of the locking means, the latch plate is movable between a lower position and a raised or locking position, and when in the raised or locking position at least a portion of the latch plate projects above an end wall of the shank member and engages a part of the line jack unit socket to prevent removal of the telephone lock from the line jack unit.

4,964,285

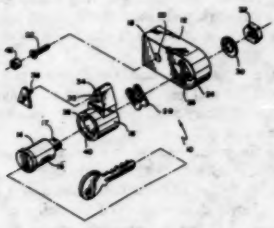
COMPUTER DRIVE BEZEL ATTACHMENT

Robert P. Lakoski, Austin, Tex., and Jody L. Numbers, Tempe, Ariz., assignors to Lama Systems Inc., Austin, Tex.

Filed Nov. 7, 1988, Ser. No. 268,283

Int. Cl.[5] E05B 73/00

U.S. Cl. 70—14 7 Claims



1. A device for external attachment to a computer diskette drive having a slotted aperture, comprising:

a base having a first and second surfaces including a first aperture and a second aperture extending therethrough, said first aperture featuring a recessed flange and dimensioned to receive a screw and said second aperture being surrounded by a recess on said first surface dimensioned to receive a stop washer of a desired configuration, and a recessed flange formed in said second surface dimensioned to receive a nut,

a rotatable blocking means for blocking the diskette drive when rotated from an unblocking position to a blocking position, said blocking means having a cylindrical core with axially extending grooves,

a lock plug featuring retractable pins, and a shaft of non-circular cross-sectional dimensions, said lock plug being positionable in the core of said blocking means and said shaft extending through said blocking means,

a stop washer of desired configuration to correspond to said recess, and having an aperture of corresponding dimensions to the cross-section of said shaft,

a nut dimensioned to attach to said shaft where said shaft extends through said stop washer and is attached to said base with said nut,

a screw for passing through said first aperture and dimensioned to pass into the computer, and a plug dimensioned to fit into said first aperture over said screw.

4,964,286

SECURITY DEVICE FOR A VIDEO RECORDER OR PLAYER

Michael Poyer, 42 Golden Grove, Swansea, United Kingdom

PCT No. PCT/GB88/01084, § 371 Date Jun. 30, 1989, § 102(e) Date Jun. 30, 1989, PCT Pub. No. WO89/05510, PCT Pub. Date Jun. 15, 1989

PCT Filed Dec. 12, 1988, Ser. No. 381,667

Claims priority, application United Kingdom, Dec. 10, 1987, 8728838; Oct. 3, 1988, 8823134

Int. Cl.[5] E05B 73/00

U.S. Cl. 70—58 8 Claims

1. A security device for a video cassette player or recorder comprising a casing having a cassette-receiving opening and a cassette-receiving mechanism within said opening, said device comprising:

(a) a body which is insertable in said opening, the length and breadth of said body being substantially the same as the corresponding dimensions of a standard video cassette, but the depth of said body being smaller than that of said video cassette such that a functional video cassette may remain in said player when said security device is fitted thereon.

(b) a locking mechanism housed in said body, said locking mechanism including opposed locking members extending longitudinally of the body, said locking members each being movable between respective retracted positions in which said locking members are contained substantially wholly within the length, breadth and depth of said body, and locking positions in which end portions of said locking members extend beyond the longitudinal ends of said body, in which locking positions end surfaces provided on said end portions are arranged to frictionally engage the internal side walls of said opening to retain the body in said opening, at least one of said end surfaces having a stepped profile which is so shaped as to in use increase its grip on the respective side wall while said locking members are in said locking positions; and

(c) a peripheral flange provided on said body for engaging said casing around the periphery of said opening, so as to prevent insertion of said body to a depth which would cause activation of said cassette-receiving mechanism.

4,964,287

QUICK-RELEASE BICYCLE AXLE ASSEMBLY

Richard K. Gaul, 1901B E. Washington St., Urbana, Ill. 61801

Filed Dec. 9, 1988, Ser. No. 281,703

Int. Cl.[5] E05B 71/00

U.S. Cl. 70—233 4 Claims

1. An apparatus for rotatably securing a wheel to a fork portion of a bicycle frame, comprising:

a hub having first and second end portions and a bore extending axially therethrough;

a drawbar having first and second end portions and being positioned extending through the axial hub bore, said drawbar first end portion extending past the hub first end portion and being threaded, said drawbar second end portion extending past the hub second end portion and having a bore extending transversely therethrough;

first and second lock washers having a central bore extending therethrough and being connected to the fork portion of said frame and respectively positioned about and adjacent said first and second drawbar end portions, each of said lockdown washers having a raised portion extending therefrom into said fork portion whereby relative rotation

therebetween is prevented, and a raised, knurled portion disposed about the inner periphery of said central bore and extending in a direction generally away from said hub, said first and second lockdown washers being of an open toroidal configuration wherein the magnitude of the toroidal opening is greater than the drawbar diameter;

a cap nut having a central bore threadably attached to the drawbar first end portion and a recessed knurled portion adapted to mate with the raised, knurled portion of said first lockdown washers;

a housing having a central bore disposed about the second end position of said drawbar, a recessed, knurled portion extending about the periphery of said housing bore and adapted to mate with the raised, knurled portion of said second lockdown washer, and a second bore generally orthogonal to and connected with said housing central bore;

a cam extending through said housing second bore and into said transverse drawbar bore whereby rotation of said cam produces longitudinal movement of said drawbar between a first and second preselected positions.

4,964,288

LOCKING DEVICE AND REVERSIBLE KEY

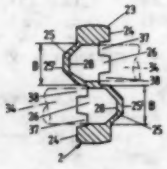
Peter B. Braun, Bornheim; Herbert P. Häuser, Eladorf-Heppendorf, and Alexander Stefanescu, Cologne, all of Fed. Rep. of Germany, assignors to DOM-Sicherheitstechnik GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Filed Jul. 31, 1989, Ser. No. 387,045

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1988, 3827687

Int. Cl.[5] E05B *19/04*

U.S. Cl. 70—406 **13 Claims**



1. A locking device comprising a lock cylinder and a reversible flat key having at least one broad face on each of opposite sides of said key with a row of indentations located on each of said broad faces of said key for the arrangement of tumbler pins, and having a rib on each side of said key and associated with each row of indentations, into the sectional area of which at least one of the pins extends and the crest of which said rib projects beyond said associated broad face of the key, wherein the deepest reaching indentation of said row on one side of said key lies nearest to said crest of said rib which projects beyond said broad face on the opposite side of said key and that several indentations of said row of indentations are integrated into a through groove of variable depth levels.

4,964,289

PROCESS AND DEVICE FOR REGULATING THE FLATNESS OF A COLD ROLLED METAL STRIP

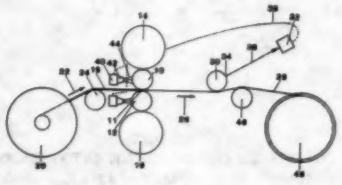
Robert J. Dean, Uhwiesen, Switzerland, assignor to Swiss Aluminum Ltd., Chippis, Switzerland

Filed Dec. 18, 1989, Ser. No. 451,807

Claims priority, application Switzerland, Dec. 30, 1988, 4857/88

Int. Cl.[5] B21B *37/10*

U.S. Cl. 72—13 **17 Claims**



1. Process for registering temperature differences of cold rolled metal strip for the purposes of regulating the flatness of the strip, which comprises:

providing a cold rolling mill having a roll gap formed between two work rolls thereof;

feeding a metal strip through the roll gap to cold roll the strip;

providing at least one contact roll as a tension roll downstream of the roll gap, said contact roll having low back-reflection capacity and high capacity for emission of infra-red radiation;

deflecting the metal strip after it emerges from the roll gap by said contact roll, without slipping;

providing an infra-red detector situated at a distance from the metal strip downstream of the roll gap;

determining local temperature differences linearly over the whole width of the metal strip after it emerges from the roll gap by measuring the infra-red radiation along a mantel line on said contact roll by said detector; and

converting said measured infra-red radiation into control signals to actuate control means for said cold rolling mill.

4,964,290

SMALL-DIAMETER METALLIC CONDUIT BENDING MACHINE

Sadao Kimura, Numazu, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Shizuoka, Japan

Filed Jun. 21, 1989, Ser. No. 369,310

Claims priority, application Japan, Oct. 20, 1988, 63-264954

Int. Cl.[5] B21D *7/024*

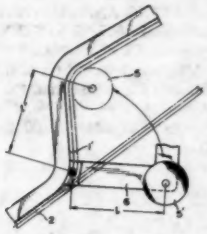
U.S. Cl. 72—217 **15 Claims**

1. A small-diameter metallic conduit bending machine for bending a small-diameter metal conduit into a finished curved shape, said shape comprising at least first and second oppositely oriented curves lying in a single bend plane, said machine comprising:

a stationary frame formed by connecting bar stock or pipe stock together into a shape substantially conforming to the finished curved shape of the metallic conduit over the whole length and having an elongated guide surface, fixedly connected to the frame and against which said conduit is bendable, said guide surface defining a convex bend section which has a curvature smaller than the bend radius of the first curve of the metallic conduit in the lengthwise direction of the guide surface and which is

substantially orthogonal to the bend plane of the conduit in the widthwise direction of the guide surface, the guide surface further defining a concave bend section having a curvature smaller than the bend radius of the second curve of the conduit in the lengthwise direction of the guide surface and being substantially orthogonal to the bend plane of the conduit in the widthwise direction of the guide surface.

a bending member having a convex peripheral surface substantially equal to the curvature of the concave bend section facing the guide surface and attached to a lever extending outward from the convex bend section, one end



of said lever being pivoted to a position lying substantially on the axial center line of the metallic conduit within a central portion of the convex bend section metallic conduit is bent so as to iie along the guide surface, the distance from the center of rotation of the lever to the center of curvature of the guide member being equal to the distance from the center of rotation of the lever to the center of curvature of the concave bend section, and

an actuator attached to the frame for turning the lever,

whereby the metallic conduit is bent so as to lie along the guide surface through the convex and concave bend sections thereof.

4,964,291

COIL SHAPERS FOR COILS OF ROTATING ELECTRIC MACHINES

Macolm Otty, Merseyside, United Kingdom, assignor to Automated Coil Systems Limited, Liverpool, England

Continuation of Ser. No. 689,306, Jan. 7, 1985, abandoned, which is a continuation of Ser. No. 529,734, Sep. 6, 1983, abandoned. This application May 5, 1986, Ser. No. 861,648

Claims priority, application United Kingdom, Sep. 9, 1982, 8225804

Int. Cl.[5] B21D *53/00*

U.S. Cl. 72—298 **18 Claims**

1. A coil shaper for coils of rotating electric machines, each said coil initially having two parallel straight sections joined by two curved end sections, said coil shaper comprising:

first grippers substantially aligned along a first direction;

second grippers substantially aligned along said first direction;

means for supporting said first grippers and moving said first grippers from a first position adjacent said second grippers to a second position spaced from said second grippers while simultaneously rotating said first grippers about an axis extending in said first direction;

means for supporting said second grippers and moving said second grippers from a first position adjacent said first grippers to a second position spaced from said first grippers while simultaneously rotating said first grippers about an axis extending in said first direction, whereby in a coil held by said shaper with said straight sections of said coil respectively gripped by said first and second grippers, said straight sections are mutually rotated and separated in a second direction, said separated straight sections being mutually connected at each end thereof by two diagonal sections and one of said curved end sections;

third grippers positioned for gripping each of said curved end sections, said third grippers comprising means for controlling the position of said curved end sections during separation and rotation of said straight sections; and

fourth grippers positioned for gripping each of said diagonal sections.

4,964,292

SHOCK-ABSORBING FLUID-ACTUATED PRESSURE SYSTEM

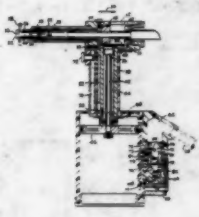
John J. Kaelin, Saugerties, and Gary L. Port, Woodstock, both of N.Y., assignors to Huck Manufacturing Company, Irvine, Calif.

Continuation of Ser. No. 285,469, Dec. 16, 1988, Pat. No. 4,878,372. This application Jul. 31, 1989, Ser. No. 387,035

The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.

Int. Cl.[5] B21J *15/22*

U.S. Cl. 72—453.17 **5 Claims**



1. A fluid pressure system comprising:

an actuator cylinder;

an actuator piston slidably positioned in the actuator cylinder to subdivide the cylinder into first and second chambers;

first and second separate fluids said first fluid being a liquid and said second fluid including a liquid;

pump means having a forward stroke for pumping the first fluid into the first chamber while withdrawing the second fluid from the second chamber to thereby move the piston in a first direction;

said pump means having a return stroke for pumping the second fluid back into the second chamber while withdrawing the first fluid from the first chamber to thereby move the piston in a second direction; and

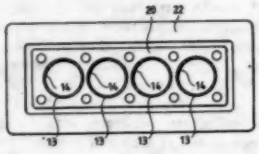
means for admitting gas into said second fluid to thereby form a gas liquid foam mixture.

4,964,293

METHOD OF MANUFACTURING METALLIC GASKETS

Kunitoshi Inoue, Higashiosaka; Shigeru Kawaguchi, Daito, and Kazuhiro Nomoto, Higashiosaka, all of Japan, assignors to Nippon Gasket Co., Ltd., Higashiosaka, Japan

Filed Mar. 24, 1989, Ser. No. 328,270
Claims priority, application Japan, Mar. 28, 1988, 63-71789
Int. Cl.[5] B21K *3/00*
U.S. Cl. 72—379.2 8 Claims



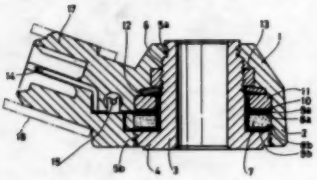
1. A method of manufacturing metallic gaskets, comprising:
placing a metallic gasket material and a hard forming body close to the metallic gasket material on a flat surface of a mount, said metallic gasket material having a waved bead portion and being coated with a resin to a specified thickness, wherein said hard forming body has a thickness smaller than a thickness of the metallic gasket material; and
prestressing the metallic gasket material by a press means to a mount to render a stress in a tension side of the bead portion of the metallic gasket material that is greater than stress that will occur in the metallic gasket under use, when assembled.

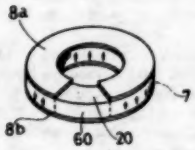
4,964,294

NON-RESONATING TYPE KNOCK SENSOR

Shogo Kawajiri; Akio Ito, and Katsumi Yamamoto, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Aug. 15, 1989, Ser. No. 394,363
Claims priority, application Japan, Sep. 12, 1988, 63-120062; Feb. 18, 1989, 1-38925; Feb. 21, 1989, 1-42550; Feb. 21, 1989, 1-42551
Int. Cl.[5] G01L *23/22*; G01P *15/09*
U.S. Cl. 73—35 12 Claims





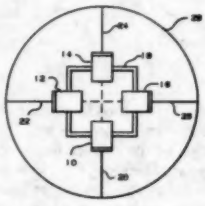
1. A non-resonating type knock sensor for an internal combustion engine, comprising a cylindrical body having a through hole and adapted to be mounted on the engine by a bolt inserted through the through hole, a cylindrical connector wall extending radially outwardly from the cylindrical body, an annular piezoelectric element coaxially disposed in and embedded within the wall of said cylindrical body and having a pair of electrodes on both sides thereof, and a pair of terminal pins extending axially within said connector wall and each in electrical contact with respective one of said electrodes, characterized in that said piezoelectric element has a non-polarized portion at a position adjacent to said connector wall so that a vibration transmitted from said connector wall to said piezoelectric element does not substantially cause said piezoelectric element to generate an electrical output.

4,964,295

BORE MAPPING AND SURFACE TIME MEASUREMENT SYSTEM

Lawrence D. Nottingham, Charlotte, N.C.; Thomas E. Michaels, and Jennifer E. Michaels, both of Freeville, N.Y., assignors to Westinghouse Electric Co., Pittsburgh, Pa.

Filed Jun. 26, 1986, Ser. No. 878,649
Int. Cl.[5] G01N *29/00*
U.S. Cl. 73—1 DV 9 Claims



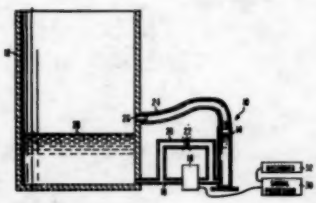
1. A bore mapping system, comprising:
a bore mapping transducer positioned in a bore, producing a transmitted measuring pulse and receiving a reflected measuring pulse; and
diameter calculation means for calculating a bore diameter from a measured time interval between the transmission of the transmitted measuring pulse and the receipt of the reflected measuring pulse, a calibration time previously measured and a calibration diameter.

4,964,296

METHOD AND APPARATUS FOR DETECTING LIQUID LEAKS

Jay E. Jensen, Raritan, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 183,121, Apr. 19, 1988, Pat. No. 4,893,498.
This application Sep. 28, 1989, Ser. No. 413,577
Int. Cl.[5] G01M *3/26*
U.S. Cl. 73—49.2 5 Claims



1. A method of detecting leakage of a liquid from an aboveground tank of uniform dimensions comprising the steps of:
filling an upright standpipe of uniform dimensions with liquid from the tank until the liquid in the standpipe is at the same level as the liquid in the tank; and

measuring the pressure differential between the pressure of the liquid at substantially the bottom of the tank and the pressure of the liquid at substantially the bottom of the standpipe to determine any change in the pressure differential caused by leakage of liquid from the tank.

4,964,297

VISCOSIMETER

Lawrence I. Wechsler, 1 Wooleys La., Great Neck, N.Y. 11023

Continuation-in-part of Ser. No. 148,011, Jan. 25, 1988, Pat. No. 4,873,872. This application Oct. 3, 1989, Ser. No. 416,046

Int. Cl.[5] G01N *11/12*

U.S. Cl. 73—57 **4 Claims**

1. A viscosimeter comprising a straight tube which is closed at one end and has a uniform internal diameter and a plurality of members adapted to be disposed within the tube, at least one of the members having an aperture extending in the axial direction of the tube, and each apertured member having a thickness between the aperture and the periphery of the member which is uniform in the axial direction of the tube, the opening provided by the aperture in each of the apertured members being different for each of the members respectively, whereby all members of the plurality of members fall through a fluid disposed in the tube at different rates, thereby producing viscosity indications for different ranges of viscosity.

4,964,298

DEVICE FOR CONTROLLING THE AIR PRESSURE IN THE LOW PRESSURE ENVIRONMENTAL TESTING CHAMBER FOR SELF-PROPELLED VEHICLES

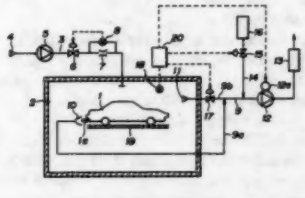
Kyozo Matsushita, Tokyo, Japan, assignor to Kabushiki-kaisha Toyo Seisakusho, Tokyo, Japan

Continuation of Ser. No. 23,458, Mar. 9, 1987, abandoned. This application Sep. 29, 1988, Ser. No. 253,304

Claims priority, application Japan, Mar. 2, 1987, 62-047326

Int. Cl.[5] G01M *15/00*

U.S. Cl. 73—117.1 **3 Claims**



1. A device for controlling the air pressure in a low pressure environmental testing chamber for self-propelled vehicles, comprising:

means for introducing outside air into the testing chamber;

a first air pipe having an air suction port at one end thereof positioned in the vicinity of a discharge opening of a discharge duct of a vehicle disposed in said testing chamber and having the other end thereof connected to a main air pipe;

a second air pipe having an air inlet at one end thereof opened into said testing chamber and having the other end thereof connected to said main air pipe through a first flow regulating valve;

an air blower adapted for reducing air pressure in said testing chamber, said air blower having a variable r.p.m. and mounted in said main air pipe to selectively communicate said testing chamber with the atmosphere;

a first silencet provided in said main air pipe at an air discharge side of said air blower, said silencer being opened into the atmosphere; and

a branched pipe having a second silencer at an outside-air-intake end thereof, said branched pipe having an end opposite to said second silencer connected to said main pipe between an output of said first flow regulating valve and a suction side of said air blower, said branched pipe having mounted therein a second flow regulating valve between said second silencer and said end connected to said main air pipe;

a pressue sensor disposed within said testing chamber; and

means responsive to an output signal of said pressure sensor for controlling said first and second flow regulating valves to maintain the air pressure in the environmental testing chamber at a preset level.

4,964,299

APPARATUS FOR MEASURING, IN A TIRE TESTING MACHINE, RADIAL AND AXIAL FORCES AT A WHEEL CONSISTING OF A PNEUMATIC TIRE AND A RIM

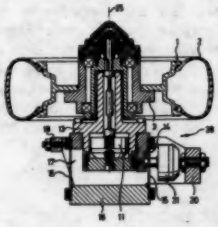
Manfred Maier, Rossdorf; Franz Ruppert, Heppenheim, and Joachim Schwab, Darmstadt, all of Fed. Rep. of Germany, assignors to Gebr. Hofmann GmbH & Co. KG, Fed. Rep. of Germany

Filed Jul. 15, 1988, Ser. No. 219,230

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723767

Int. Cl.[5] G01M *17/02*

U.S. Cl. 73—146 **12 Claims**



1. An apparatus for measuring, in a tire testing machine, the radial and axial forces at a wheel consisting of a pneumatic tire mounted to a rim, the testing machine including a roll-off base upon which the pneumatic tire rolls during the measuring run, a measuring axle on which the wheel is rotatably mounted during the measuring run and force measuring devices for the radial and axial forces, the apparatus comprising:

a measuring axle having first and second cylindrical axle parts, including a first, interior axle part coupled to a base plate so as to be movable in a straight line, radially to relative to said roll-off base, in a frictionless manner, and

a second, exterior axle part frictionlesaly axially mounted on said first axle part;

a flexible tension-compression rod extending along an axis of the wheel to be tested and rigidly connected with the second axle part in the axial direction for the introduction of axial forces into a first force measuring device supported at the first axle part; and

a second force measuring device connected between the base plate and said first axle part for measuring radial forces in the moving direction direction of said first axle part.

4,964,300

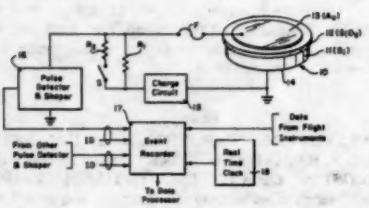
METHOD AND APPARATUS FOR DETERMINING TIME, DIRECTION AND COMPOSITION OF IMPACTING SPACE PARTICLES

William H. Kinard, Williamsburg; S. Fred Singer, Arlington, both of Va.; Jim J. Wortman, Chapel Hill, N.C.; Donald H. Humes, Hampton, Va.; Philip C. Kassel, Jr., Hampton, Va., and John E. Stanley, deceased, late of Wayne, N.J. (by Marguerite Stanley, executrix), assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 21, 1989, Ser. No. 369,490

Int. Cl.[5] G01W *1/00*

U.S. Cl. 73—170 R **8 Claims**



5. Apparatus for collecting particles from space comprising an MOS capacitor having a thin-film metal plate exposed to space, an oxide layer, and a substrate serving as a second plate of said capacitor, circuit means for charging said capacitor through a high impedance path and a fuse, and for maintaining said charge through a low impedance path and said fuse, means for detecting discharge of said capacitor upon impact of a first particle from space, and means responsive to the detection of discharge for recording the real time of impact, whereby discharging current melts away said thin-film metal around the crater produced by the first particle to impact, and recharging current melts away said fuse to prevent any charge and discharge for subsequent particles so that craters produced by subsequent particles may be distinguished by not having thin-film metal melted away.

4,964,301

CHIP LEVEL INDICATOR WITH DIFFERENTIAL TRANSFORMER

Claes G. Lysen, Karlstad, Sweden, assignor to Kamyr AB, Karlstad, Sweden

Filed Apr. 25, 1989, Ser. No. 342,932

Int. Cl.[5] G01F *23/28*

U.S. Cl. 73—290 R **18 Claims**

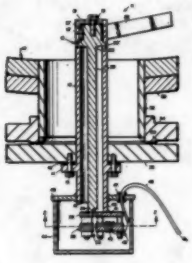
1. A detector for detecting the solids position in a vessel—which vessel has an axis—adapted to have solid particles moving therein generally along said axis, comprising:

a first hollow shaft having a shaft axis passing through the center thereof;

a second shaft, generally concentric with said first shaft, and extending along said shaft axis and having first and second means for operatively fixing said first shaft at a first portion thereof to said vessel, with a first end remote from said first portion and extending into said vessel;

means for operatively connecting said second shaft first end to said first end of said first shaft, said second end of said second shaft being free;

a plate operatively connected to said first shaft first end and said second shaft first end, and extending as a cantilever



therefrom, so that it is generally perpendicular to the axis of said vessel, and

sensing means, including a first sensor element mounted to and movable with said second shaft second end, and a stationary sensor element mounted to said first shaft and adjacent said first sensor element, for sensing twisting motion of said first shaft as a result of solid paticles acting on said cantilevered plate.

4,964,302

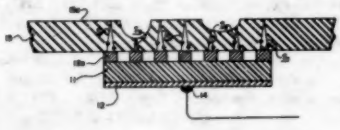
TACTILE SENSOR

Allen R. Grahn, 3735 Emigration Canyon, Salt Lake City, Utah 84018, and Lynn Astle, 4291 Holly Drive, Salt Lake City, Utah 84124

Filed Sep. 25, 1984, Ser. No. 653,904

Int. Cl.[5] G01B *17/02*

U.S. Cl. 73—865.7 **9 Claims**



1. A sensor comprising

a deformable medium;

ultrasonic transducer means for transmitting an ultrasonic signal at one point into the said medium and for receiving an echo returned after said ultrasonic signal has been transmitted and returned from a surface of the medium opposite said one point; and

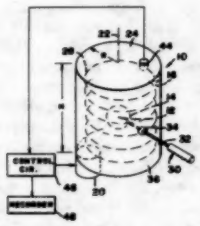
current means for determining the time differential between transmisaion of the signal and the receipt of the echo and for converting said time differential into a distance measurement for determining deformation of the medium and for determining the echo polarity.

4,964,303

ACOUSTIC POSITIONING AND ORIENTATION PREDICTION

Martin B. Barmatz, Glendale; Glenn Aveni, Sunland; Seth Putterman, Sherman Oaks, and Joseph Rudnick, Los Angeles, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 15, 1988, Ser. No. 271,265
Int. Cl.[5] G01K *15/00*
U.S. Cl. 73—505 20 Claims



1. A method for determining the equilibrium position in a zero gravity environment of an object in an acoustic standing wave field of given mode, where the acoustic field is other than a simple plane wave field, comprising:

establishing an acoustic standing wave field of given mode, and establishing said object in a plurality of different positions in said field;

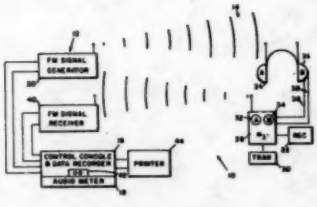
experimentally determining the center resonant frequency of said mode at each of said positions, including determining at which of said positions the center resonant frequency is lowest, to thereby determine the equilibrium position of said object in said field, which is the position at which the center resonant frequency was lowest.

4,964,304

AUDIOMETRIC TESTING METHOD AND APPARATUS

Leo K. Eckstein, 11350 Kingsland St., Los Angeles, Calif. 90066

Filed Mar. 18, 1988, Ser. No. 170,245
Int. Cl.[5] A61B *1/22*
U.S. Cl. 73—585 10 Claims



1. An audiometer comprising:

means for transmitting an FM radio signal carrying an audiometric test signal on a selected one of a pair of radio transmitting channels; and,

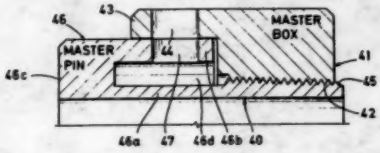
FM receiver means for receiving said FM radio signal on one of a pair of radio receiving channels, said FM receiver means including a pair of earphones, wherein each earphone of said pair of earphones is coupled to a respective one of said pair of radio receiving channels for separately applying said audiometric test signal to a patient's ears.

4,964,305

METHOD AND APPARATUS FOR GAGING PIPE THREADS

George M. Raulins, 12408 Veronica, Farmers Branch, Tex. 75234

Filed Feb. 9, 1990, Ser. No. 477,619
Int. Cl.[5] G01L *5/24*
U.S. Cl. 73—761 23 Claims



1. A thread gaging and marking system comprising:

a first tubular gage having first threads at one end and a first marking section at the other end,

and a first radial marking hole in said first marking section;

a second tubular gage having second threads at one end for making up with said first threads and a second marking section at the other end,

and a second radial marking hole in said second marking section;

said first and second marking sections telescoping and said first and second marking holes in register when said first and second threads are made up a selected amount,

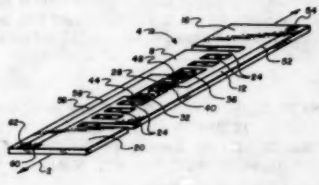
said first radial marking hole positioned to partially overly the end of a box when a box is make up with said one tubular gage said selected amount.

4,964,306

FIELD-BASED MOVEMENT SENSOR

Stephen C. Jacobsen, and John E. Wood, both of Salt Lake City, Utah, assignors to Sarcos Group, Salt Lake City, Utah

Filed Apr. 3, 1989, Ser. No. 332,593
Int. Cl.[5] G01B *7/16*
U.S. Cl. 73—763 55 Claims



24. A flexible force transducer for measuring force applied to the transducer along an axis, said transducer comprising

a substrate having a top surface and a bottom surface and formed with a first finger projecting from a first direction, and a second finger projecting from a direction opposite the first direction to a position on one side of the first finger, said fingers extending generally perpendicular to said axis and said first finger being moveable with respect to the second finger when the substrate is subjected to a force along the axis,

means disposed on the top surface of the second finger for producing an electric/magnetic field which emanates laterally therefrom, and

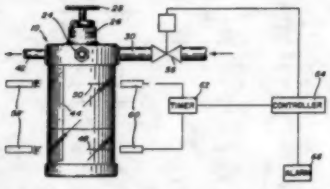
means disposed on the top surface of the first finger for detecting variations in the strength of the electric/magnetic field and thus relative movement of the first finger with respect to the second finger.

4,964,307

LIQUID FLOW MEASURING DEVICE

Rod H. Bryce, 150, 53rd Avenue, Lachine Quebec, Canada H8T 2Z1

Filed Aug. 8, 1988, Ser. No. 229,422
Int. Cl.[5] G01F *1/00*
U.S. Cl. 73—861 8 Claims



1. A liquid flow measuring device comprising:

a container body for liquid having a transparent side such that liquid level within the container body is visible with a low level mark and a high level mark;

a liquid inlet for said container;

a first liquid outlet for discharging from a lower portion of the container body to an outlet line, said first outlet having a port below the low level mark;

a second liquid outlet at the top of the container body connecting to said outlet line;

valve means for said outlet line, said valve means being moveable between a first position, in which said second liquid outlet is open, and a second position, in which said second liquid outlet is closed;

means for biasing said valve means toward said first position;

a compressed air inlet communicating with said valve means with an air outlet communicating with said container, said valve means is structured to move to said second position upon compressed air being admitted into said compressed air inlet;

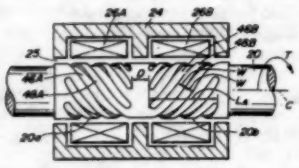
whereby said valve means is moved to said second position by admitting compressed air into said air inlet, said compressed air flowing into said container via said air outlet and forcing fluid out of said container via said first liquid outlet until said fluid level is below said low level mark, after which said supply of compressed air is arrested to allow said valve means to return to said first position so that said container can refill with said fluid.

4,964,308

MAGNETOSTRICTIVE DEVICE FOR MEASURING TORSIONAL TORQUE

Shouichi Edo, No. 23-236, Katsuraoka-cho, Otaru City, Hokkaido, and Hiroyuki Aoki, No. 621, Nobe-cho, Konan-ku, Yokohama City, both of Japan

Division of Ser. No. 11,330, Feb. 5, 1987, Pat. No. 4,823,620.
This application Jan. 31, 1989, Ser. No. 304,441
Claims priority, application Japan, Feb. 10, 1986, 61-28364; Nov. 5, 1986, 61-262009
Int. Cl.[5] G01L *3/10*
U.S. Cl. 73—862.36 12 Claims



1. A device for measuring torsional torque applied to a shaft which is made of a magnetic material at least in a surface region thereof, the device comprising:

an exciting coil positioned close to the shaft so as to produce a magnetic circuit in which the magnetic flux path includes a selected section of the shaft;

detection means for detecting a magnetostrictive change induced in said section of the shaft by torsional torque applied to the shaft; and

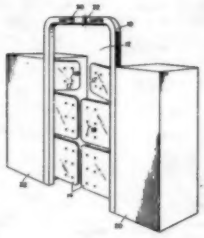
flux directioning means for differentiating the level of the surface of the shaft in a series of elongate and parallel regions of said section, said flux directioning means being integral with the shaft, said elongate and parallel regions being inclined at a predetermined angle with the longitudinal axis of the shaft, wherein said flux directioning means comprises a series of elongate and parallel grooves; formed in the surface of said section of the shaft and inclined at said predetermined angle and wherein said grooves extend spirally, wherein the depth of said grooves from the surface of the shaft is approximately 0.5 to 1.5 mm, said grooves defining parallel and spirally extending lands therebetween, and wherein a surface region of the shaft is hardened at least in said selected section to a depth of about 0.1–1.5 mm after forming said grooves such that in each of said lands between said grooves the hardened region occupies at least about 10% of the cross-sectional area of the land.

4,964,309

PORTAL VAPOR DETECTION SYSTEM

Anthony Jenkins, North Reading, Mass., assignor to Ion Track Instruments, Burlington, Mass. and Ion Track Instruments, Burlington, Mass.

Filed Feb. 16, 1989, Ser. No. 311,467
Int. Cl.[5] G01N *31/00*
U.S. Cl. 73—864.81 20 Claims



1. A vapor sampling system for sampling vapor proximal to a body of a subject, the system comprising:

a vapor analyzer to determine the components of a sample of gas;

a moveable panel positioned in a doorway. the panel supporting a sampling tube with inlet ports through which vapor samples are drawn, the sampling tube transporting a gas flow from the inlet ports to the vapor analyzer, and the inlet ports drawing the gas flow from a region proximal to the body of the subject as the panel is displaced by the body of the subject passing through the doorway.

4,964,310

DISINTEGRATION TESTING DEVICE

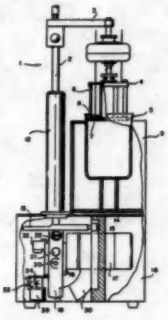
Ortwin Schneider, Weiterstadt, Fed. Rep. of Germany, assignor to Erweka Apparatebau GmbH, Heusenstamm, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 311,057

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1988, 3804688

Int. Cl.[5] G01N *19/00*

U.S. Cl. 73—866 10 Claims



1. A disintegration testing device for detecting the disintegration behavior of solid particles in liquids, which comprises

a supporting device having a carrier which is mounted for reciprocating in a vertical direction, said carrier supporting a vessel which contains the solid particles,

a liquid bath into which the vessel is submergible,

a first lifting device including a roller which is arranged at a lifting arm at a given distance from a drive shaft driven by a motor, said roller supporting the carrier which moves the vessel in the upward and downward directions in the liquid upon a rotation of the lifting arm, and

a second lifting device which, upon its activation, lifts the vessel out of the liquid bath, said second lifting device including an activable second roller which is arranged at the lifting arm at a greater radial distance from the driving shaft than the first roller and upon its activation supports the carrier for lifting the vessel out of the liquid.

4,964,311

DIGITALLY INCREMENTED LINEAR ACTUATOR

Mathew G. Boissevain, Los Altos, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Filed Jan. 27, 1989, Ser. No. 303,450

Int. Cl.[5] G05G *11/00*

U.S. Cl. 74—110 21 Claims

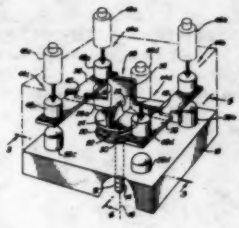
1. A linear actuator for providing a plurality of discrete linear actuator steps, comprising:

a base;

an actuator member movable relative to said base in a linear direction;

lever means, pivotably mounted to said actuator member at a pivot position centrally located on said lever means and linearly movable with said actuator member, for driving the actuator member through said pivot position;

linear drive means, provided adjacent said lever means, for selectively driving said lever means at a plurality of drive positions through a stroke distance differing at each stroke position, said drive positions being displaced from said pivot position so as to cause pivoting of said lever means and linear motion of said actuator member from said first position by an amount determined by said selected one or more of said drive positions; and



biasing means for providing a biasing force between said base and said lever means and actuator member so as to hold said lever means against said linear drive means.

4,964,312

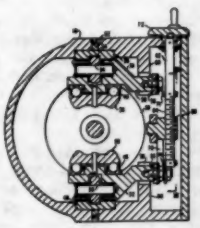
INFINITELY VARIABLE TRACTION ROLLER TRANSMISSION

Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.

Filed Oct. 17, 1988, Ser. No. 259,043

Int. Cl.[5] F16H *13/10*

U.S. Cl. 74—199 7 Claims



1. An infinitely variable traction roller transmission comprising: a housing; two toric traction discs rotatably supported in said housing, one for rotation with an input shaft and the other for rotation with an output shaft, said toric discs having opposite traction surfaces defining therebetween a toric cavity of circular cross-section; at least two motion transmitting traction rollers arranged in said toric cavity in radial symmetry and in engagement with said toric discs for the transmission of motion therebetween, each of said traction rollers being rotatably supported in said housing by a pivot trunnion adapted to pivot about a control axis which is essentially tangential to the center circle of said toric cavity, each of said pivot trunnions having a support roller mounted thereon and a partial circular track structured arranged adjacent each pivot trunnion and supporting the support roller thereof, said track structures being adapted to force the traction rollers on said pivot trunnions into force transmittin engagement with said toric discs, each of said trunnions having a control end projecting along said control axis and being pivotally supported in said housing such that said control end is additionally movable in a plane normal to the axis of said toric discs for tilting said trunnion about the point of support of said support roller on said partial circular track structure; and means for supporting and controllably tilting said trunnions in unison in said plane in the same angular

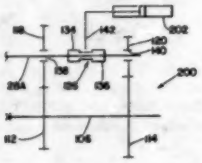
sense with respect to the axis of the toric discs so as to provide for precess motion of said traction rollers for initiation of a transmission ratio change.

4,964,313

TWO-SPEED GEAR TRAIN ASSEMBLY

Alan R. Davis, Plainwell, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 24, 1988, Ser. No. 261,955
Int. Cl.[5] F16H *3/08*
U.S. Cl. 74—331 **10 Claims**



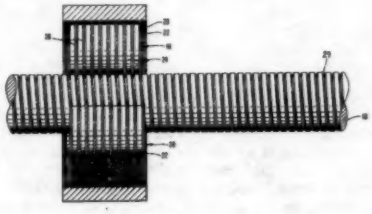
1. A two-speed gear only train assembly (200) comprising:
a first shaft (28A) having a primary direction of rotation;
a first rotatable member (118) rotatable relative to said first shaft (28A); p1 a second rotatable member (120) rotatable relative to said first rotatable member and relative to said first shaft;
drive means (112, 106, 114) in constant driving relation with said first and second rotatable members, said drive means causing said second rotatable member to rotate in the same direction and faster than said first rotatable member;
A first positive non-synchronized clutch (204) for selectively clutching said first rotatable member (118) to said first shaft (28A), said first clutch comprising a first array of clutch teeth (138) carried by said first rotatable member (118) and a second array of clutch teeth (134) fixed for rotation with said first shaft (28A) and engageable with said first array of clutch teeth;
a second positive non-synchronized clutch (206) for selectively clutching said second rotatable member (120) to said first shaft (28A), said second clutch comprising a third array of clutch teeth (140) carried by said second rotatable member (120) and a fourth array of clutch teeth (136) fixed for rotation with said first shaft (28A) and engageable with said third array of clutch teeth;
said arrays of clutch teeth (134, 136, 138, 140), when rotating in said primary direction of rotation, defining rotationally leading edges (208, 214) and rotationally trailing edges (210, 212);
actuator means (202, 142) for selectively engaging and disengaging said first (204) and second (206) clutches, said actuator means having a first position wherein said first (138) and second (134) arrays of clutch teeth are urged into engagement with a predetermined axial force and said third (140) and fourth (136) arrays of clutch teeth are separated and a second position (FIG. 4A) wherein said third (140) and fourth (136) arrays of clutch teeth are urged into engagement with a predetermined axial force and are separated, said actuator means moving directly from one said first and second positions to the other of said first and second positions with no selectable maintainable intermediate position;
said assembly characterized by:
one of said first clutch teeth trailing edges (210), second clutch teeth leading edges (208), third clutch teeth leading edges (214) and fourth clutch teeth trailing edges (212) are provided with ramps (222) for engagement with the clutch tooth edges engageable therewith, said ramps inclined axially toward and circumferentially away from the teeth edge engageable thereby and configured to provide an axial separation force, relative to the clutch tooth edges urged into contact therewith sufficient to prevent engagement of the clutch defined by the clutch teeth carrying the ramped edge and the clutch teeth contacted thereby (i) when engaging said first clutch if said first array (138) is rotating slower than said second array (134) and (ii) when engaging said second clutch if said third array (140) is rotating slower than said forth array (136), all of said first clutch teeth leading edges, second clutch teeth trailing edges, third clutch teeth trailing edges and forth clutch teeth leading edges defined by substantially noninclined axially extending surfaces.

4,964,314

DEVICE FOR CONVERTING ROTARY MOTION TO LINEAR MOTION

Donald F. Wilkes, 937 Bobcat Blvd., NE., Albuquerque, N. Mex. 87122

Filed Mar. 13, 1989, Ser. No. 322,010
Int. Cl.[5] F18H *1/16*
U.S. Cl. 74—424.8 C **15 Claims**

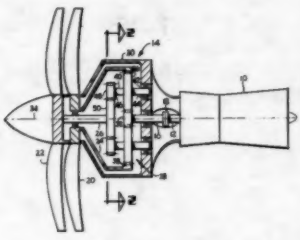


1. An apparatus for converting rotary motion to linear motion comprising:
an externally threaded longitudinally extending screw member having a longitudinal axis and an outer diameter;
at least one outer member concentrically positioned with respect to said screw member and surrounding a portion of the longitudinal extent of said screw member with an annular space being provided between an inner surface of the at least one outer member and an outer surface of the screw member, said at least one outer member having a plurality of spaced annular grooves located on the inner surface thereof, said at least one outer member having a longitudinal axis;
a plurality of planet assemblies positioned within said annular space, each of said planet assemblies having a longitudinal axis and being comprised of at least one roller, each roller having a plurality of spaced annular grooves extending circumferentially around the exterior surface thereof, each pair of adjacent grooves defining an annular ridge therebetween which extends circumferentially around the exterior surface of the roller to thereby define a plurality of spaced annular ridges on each roller, each one of the majority of said ridges engaging the thread on said screw member and also engaging one of the grooves on the inner surface of said at least one outer member, the longitudinal axes of said screw member, said at least one outer member and said plurality of planet assemblies being parallel, the outer diameter of all of said planet assemblies being substantially equal and being at least equal to the outer diameter of said screw member.

4,964,315
TRANSMISSION HAVING DUAL COUNTERROTATING OUTPUT SHAFTS

Robert J. Willis, Jr., Ipswich, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Oct. 3, 1984, Ser. No. 657,435
Int. Cl.[5] F16H 37/06
U.S. Cl. 74—665 GA 20 Claims

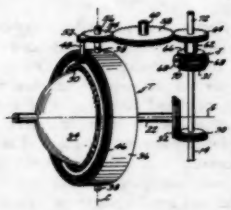


1. A transmission comprising:
an epicyclic star gearset including sun, idler, and ring gears;
a bull gear having a gear pitch diameter; and
a pinion gear having a gear pitch diameter less than said bull gear pitch diameter and operatively connected to said idler and bull gears for rotation therewith.

4,964,316
INFINITELY VARIABLE TRANSMISSION

Frank M. Perkins, 257 Avenida Atezada, Redondo Beach, Calif. 90277

Filed Aug. 2, 1984, Ser. No. 636,985
Int. Cl.[5] F16H 37/06, 15/26
U.S. Cl. 475—215 15 Claims

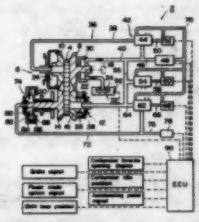


1. In a transmission having a housing and a power input and power output shaft extending thereinto, the improvement for selectively regulating the rate and direction of rotation of said power output shaft relative to said power input shaft, said improvement comprising;
a. a rigid sphere;
b. first means for rotatably supporting said sphere within said housing to rotate on a first axis;
c. second means for transferring rotating motion of said power input shaft to said sphere;
d. a tilt ring that encircles said sphere;
e. third means for selectively pivoting said tilt ring on a second axis is normal to said first axis;
f. a ring gear;
g. fourth means rotatably supported in said ring for frictionally engaging said sphere to be rotated by the latter, said fourth means including;
1. a force transmitting ring rotatably supported in said tilt ring that has said ring gear rigidly secured thereto;
2. a plurality of equally spaced rollers that extend in a great circle about said sphere, each of said rollers formed from a material that has a substantial coeffecient of friction when in contact with said sphere; and
3. mounting means for rotatably supporting said equally spaced rollers from said force transmitting ring in pressure contact with said sphere, with the axis of rotation of said rollers parallel to a plane that extends circumferentially through said force transmitting ring, said mounting means by toggle action subjecting all of said rollers to the same degree of pressure contact with said sphere when the latter rotates;
h. a differential that includes first and second power input gears, a cross bar connected to said power output shaft; a pair of idling rollers rotatably supported on said cross bar and in toothed engagement with said first and second power input gears, said first power input gear connected to said power input shaft;
i. gear means for transferring rotarty motion of said ring gear to said second power input gear, with the rate of rotation of said power output shaft sequentially decreasing, becoming stationary and then reversing relative to said power input shaft as said tilt ring is selectively pivoted towards said first axis by said third means.

4,964,317
HYDRAULIC CONTROL METHOD FOR CONTINUOUSLY VARIABLE SPEED CHANGE GEAR MECHANISM FOR A VEHICLE AND A DRIVE CONTROL METHOD FOR A PRESSURE VALVE THEREOF

Katsuaki Murano; Sadayuki Hirano, both of Hamamatsu; Yoshinori Yamashita, Hamana; Takumi Tatsumi, and Hiroaki Yamamoto, both of Himeji, all of Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan

Filed Aug. 8, 1988, Ser. No. 229,942
Claims priority, application Japan, Aug. 10, 1987, 62-199420; Oct. 31, 1987, 62-274746; Dec. 10, 1987, 62-310815
Int. Cl.[5] B60K 41/18
U.S. Cl. 74—844 17 Claims



1. A hydraulic control method for a continuously variable speed change gear mechanism including a pulley having a fixed pulley member fixed to a rotary shaft and a movable pulley member movable toward and away from the fixed pulley member in response to an oil pressure so that a groove width between said fixed and movable pulley members is respectively decreased and increased to thereby respectively increase and reduce the effective rotational radius of a belt extending between said fixed and movable pulley members to thus change a gear ratio and thereby control a gear change, pressure control valve means for controlling said oil pressure, and control unit means for controlling the operation of said pressure control valve means, said method including the step of causing said control unit means to switch a driving frequency of the pressure control valve means in accord with an

oil temperature, said step of causing said control unit means to switch said driving frequency including the step of selectively operating said control unit in first and second modes in which it switches said driving frequency according to respective first and second schedules which are different and which each define said driving frequency as a function of said oil temperature.

4,964,318

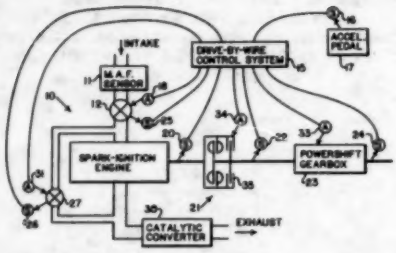
ENGINE CONTROL APPARATUS FOR IMPROVED FUEL ECONOMY

David P. Ganoung, 2800 ½ Candelaria, NW., Albuquerque, N. Mex. 87017

Continuation-in-part of Ser. No. 06/859,431, May 5, 1986, Pat. No. 4,774,858, which is a continuation-in-part of Ser. No. 06/771,660, Sep. 3, 1985, abandoned, which is a continuation-in-part of Ser. No. 06/689,185, Jan. 7, 1985, which is a continuation-in-part of Ser. No. 06/451,613, Dec. 20, 1982, Pat. No. 4,505,169, which is a continuation-in-part of Ser. No. 6/205,625, Nov. 10, 1980, Pat. No. 4,383,456, which is a continuation-in-part of Ser. No. 6/020,916, Mar. 14, 1979, Pat. No. 4,280,469, which is a continuation-in-part of Ser. No. 05/767,060, Feb. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 05/616,640, Sep. 25, 1975, Pat. No. 4,023,641. This application Jan. 19, 1988, Ser. No. 145,568 The portion of the term of this patent subsequent to Oct. 4, 2005, has been disclaimed.

Int. Cl.[5] B60K *41/18*

U.S. Cl. 74—859 **29 Claims**



1. Apparatus for powering a vehicle, comprising: a naturally-aspirated Otto cycle engine having (1) a throttle valve device used to provide substantially all control of combustion air density for the engine, the Otto engine being of a type which, in order to prevent misfire, requires intake air throttling over at least a major range of brake torque produced at a power output shaft of the engine and (2) an intake mixture preparation system operative when said throttle valve device is at least effectively wide open to automatically use intake charge dilution to provide benefits of (a) reducing brake specific fuel consumption of the engine and (b) suppressing autoignition in the engine, said wide open throttle benefits being provided by said intake mixture preparation system over at least half of a range of operating speed of said engine output shaft required to satisfy all operating conditions of the vehicle,

and a discrete-ratio gearbox which receives power from said engine power output shaft and which has a gearbox power output shaft that provides substantially all mechanical energy for powering the vehicle, substantially all of said mechanical energy for powering the vehicle being transferred from the engine to propel the vehicle without a significant time delay, whereby the technological risk of a CVT is avoided.

4,964,319

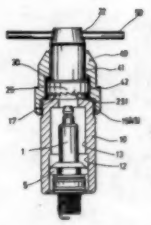
SOCKET WRENCH DEVICE FOR ROTATING A SPARK PLUG

Yun-Chi Chang, No. 9-2, Lane 2, Sec. 2, Chang-Ping Rd., Pei-Tun Dist., Tai-Chung City, Taiwan

Filed Sep. 15, 1989, Ser. No. 407,919

Int. Cl.[5] B25B *13/00*

U.S. Cl. 81—58.3 **4 Claims**



1. A socket wrench device for rotating a spark plug, said spark plug having a hexagonal intermediate portion and an externally threaded portion, said device comprising:

a socket member, having a first end surface and a second end surface, including a hexagonal hole formed in said first end surface thereof, an endless series of ratchet teeth provided on an intermediate portion of said second end surface of said socket member, and an externally threaded portion positioned near said ratchet teeth, said hexagonal hole being shaped in conformity with said hexagonal intermediate portion of said spark plug;

a driving member including an endless series of ratchet teeth provided on an end surface thereof engaging with said ratchet teeth of said socket member, an outward flange extending from said driving member, and a hole formed in said driving member;

an annular spring element sleeved on said driving member; and

a retaining sleeve having a large-inner-diameter portion located at an end thereof, a small-inner-diameter portion located at the other end of said sleeve, a middle-inner-diameter portion interposed between said small-inner-diameter portion and said large-inner-diameter portion, a large-diameter shoulder defined between inner surfaces of said large-inner-diameter portion and said middle-inner-diameter portion, and a small-diameter shoulder defined between inner surfaces of said middle-inner-diameter portion and said small-inner-diameter portion, said large-inner-diameter portion having a threaded inner surface engaged threadably with said externally threaded portion of said socket member so as to retain both said driving member and said spring element on said socket member, said spring element being brought into contact with said small-diameter shoulder of said sleeve at one end surface thereof and with said flange of said driving member at the other end surface thereof so as to bias said ratchet teeth of both said socket member and said driving member to join together, a circumference of said second end surface of said socket member being brought into contact with said large-diameter shoulder of said sleeve, both said socket member and said retainer being capable of rotating with said driving member when said driving member is initially rotated to screw said spark plug into a threaded hole of a cylinder of an internal combustion engine;

whereby, when subsequent continuous rotation of said wrench device tightens said spark plug against said cylinder to a predetermined extent, an external torque which is applied to said wrench device compresses said spring element, so that said ratchet teeth of said driving member are disengaged from said ratchet teeth of said driving

member, thereby stopping rotation of said spark plug relative to said cylinder.

4,964,320

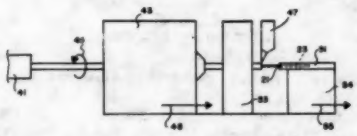
METHOD OF FORMING A BEADED TRANSFIXION WIRE

Harry E. Lee, Jr., Southaven, Miss., assignor to Engineering & Precision Machining, Inc., Memphis, Tenn.

Division of Ser. No. 288,426, Dec. 22, 1988. This application Sep. 1, 1989, Ser. No. 402,081

Int. Cl.[5] B23B *1/00, 5/00, 13/02*

U.S. Cl. 82—1.11 **8 Claims**



1. A method for forming a beaded transfixion wire for orthopedic uses comprising the steps of:

(a) rotatably and longitudinally feeding solid bar stock along a line of travel at a selected advancement rate past a cutting tool fixed in a first position to turn down a portion of said bar stock to a selected diameter to provide a first portion of an elongated wire having said selected diameter;

(b) while rotatably and longitudinally feeding said solid bar stock along said line of travel past said cutting tool feeding said first portion of said elongated wire into tube means for stabilizing said first portion against any whipping motion;

(c) continuing to rotatably feed said solid bar stock past said cutting tool while at the same time profiling a bead from said solid bar stock by moving said cutting tool outwardly and inwardly relative to the direction of travel of said bar stock, and

(d) after said bead has been formed in said bar stock and with said cutting tool positioned in said first position and while said first portion of said elongated wire is continuously rotated in said tube means turning down another portion of said bar stock to said selected diameter to provide a second portion of said elongated wire having said selected diameter.

4,964,321

BALL TURNER FOR TURNING LATHES

Hans-Jürgen Leiber, Tramelan; Jean-Philippe Meyer, Les Reussilles, and Christian F. Kummer, Tramelan, all of Switzerland, assignors to Kummer Freres Sa Fabrique de Machines, Tramelan, Switzerland

Continuation of Ser. No. 182,208, Apr. 15, 1988, Pat. No. 4,887,500. This application Nov. 2, 1989, Ser. No. 430,334

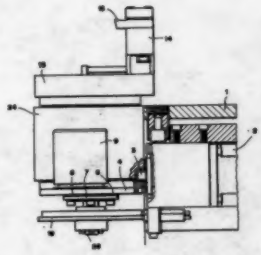
Claims priority, application Switzerland, Apr. 27, 1987, 1597/87

The portion of the term of this patent subsequent to Dec. 19, 2006, has been disclaimed.

Int. Cl.[5] B23B *5/40*

U.S. Cl. 82—12 **1 Claim**

1. A turning tool driving and adjusting device in a turning machine adapted for machining workpieces of spherical shapes, comprising a base body, a tool support rotatively movable about a vertical axis, motor means for driving said tool support about said axis, a table, means mounting the table on the tool support for movement along an adjustment axis perpendicular to said vertical axis, tool holder means secured to said table, securing means for releasably securing said table to said support, adjustments means on said tool support for moving the table on the adjusting axis, means on said tool support and table for releasing said securing means to allow relative movement between said tool support and said table along said adjusting axis, and control means for automatically and sequentially controlling rotative movements of said tool support about said vertical axis and effecting adjusting movements of



said table with respect to said tool support along said adjusting axis and further comprising a CNC system capable of memorizing as parameters the speed of rotation of the tool support about the vertical axis, the magnitude of the angle of rotation, and the magnitude of the tool correction.

4,964,322

DYNAMIC DIFFERENTIAL DRIVE

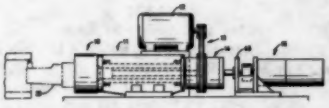
Lee Reiterman, Royal Oak, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Filed Sep. 3, 1987, Ser. No. 92,807

The portion of the term of this patent subsequent to Aug. 1, 2006, has been disclaimed.

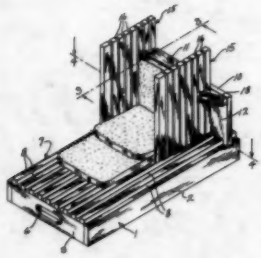
Int. Cl.[5] B23B *3/00*

U.S. Cl. 82—131 **8 Claims**



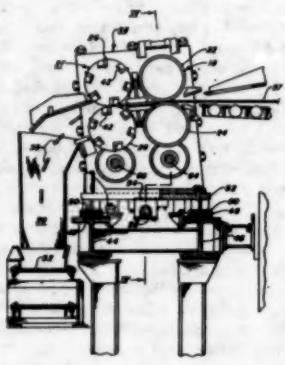
1. Rotary tool comprising a rotary tool head, means for displacing a tool, rotary motor driven spindle with drive connection to said head, rotary shaft within said spindle, means responsive to differential speeds of said respective spindle and shaft for producing displacement of said tool, and harmonic drive means for producing said differential shaft and spindle speeds, said harmonic drive means includes a housing rotating at spindle speed, a fixed axle and concentric rotational axle, a first rigid internally splined ring fixed to rotate with said housing, a second rigid internally spliced circular ring connected to rotate with said shaft, an intermediate rigid internally splined circular ring, a first eliptical wave generator coupled to said fixed axle having a flexible external spline mounted thereon with anti-friction bearings engaging internal splines of said first and intermediate rings at diametric extremities of said elliptical wave generator, a second elliptical wave generator fixed to said rotational axle having a flexible spline mounted thereon with anti-friction bearings engaging the internal splines of said second and intermediate rings at diametric extremities of said second elliptical wave generator, said drive means producing synchronous shaft and spindle speeds when said rotational axle is stationary and differential speeds responsive to rotation of said rotational axle.

4,964,323
BREAD CUTTING APPARATUS
Roger D. Fortney, 6421 Keelson Dr., Madison, Wis. 53705
Filed Oct. 2, 1989, Ser. No. 415,993
Int. Cl.[5] B26D *1/54*
U.S. Cl. 83—167 12 Claims



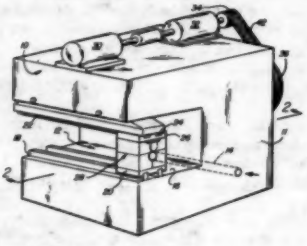
1. A bread cutting device, comprising a container having a bottom surface and an open top, a plurality of parallel spaced rails disposed across the open top of the container and located above said bottom surface, said rails being spaced apart to provide elongated openings therebetween, a backstop mounted on the container and disposed generally normal to said rails, said backstop including a generally vertical member and a plurality of generally vertical spaced parallel fingers extending from the lower end of said vertical member, said fingers being constructed and arranged to be received within said elongated openings, and a pair of slicing guides each having a lower end constructed and arranged to be received in one of said elongated openings, each guide including a plurality of parallel slits extending from the upper end of the guide to a location spaced from said lower end, a loaf of bread being adapted to be supported on said rails and by inserting a knife in aligned slits in said guides, a slice can be cut from the loaf with crumbs passing through the rails for collection in the container.

4,964,324
SIDE TRIMMER SHEAR
Drew C. Pavlick, Bethel Park, Pa., assignor to SMS Engineering, Inc., Pittsburgh, Pa.
Filed Nov. 14, 1988, Ser. No. 270,080
Int. Cl.[5] B26D *1/56*
U.S. Cl. 83—302 4 Claims



1. A side trimmer for metallic strip travelling along a pass line comprising gear housings on opposite sides of the strip as it passes along the pass line, means for varying angular positions of said gear housings with respect to said pass line, upper and lower shear knives carried on said gear housings for engaging and trimming opposed edges of said strip, a rigid drive shaft extending from one of said gear housings to the other one of said gear housings and carried within aligned bearings, gears carried on said drive shaft within the respective housings and having gear teeth with curved sidewalls to permit angular variation of the positions of the gear housings with respect to the said pass line without disturbing the alignment of said rigid drive shaft within its bearings, and gearing within said housings connecting said gears with curved sidewall gear teeth to said shear knives.

4,964,325
CUT-OFF MACHINE
Richard Hartmann, Jr., Brighton, and John H. Nolan, Mt. Clemens, both of Mich., assignors to Alpha Industries, Inc., Novi, Mich.
Continuation-in-part of Ser. No. 290,301, Dec. 27, 1988, abandoned. This application Mar. 26, 1990, Ser. No. 499,623
Int. Cl.[5] B62D *1/60*
U.S. Cl. 83—321 22 Claims

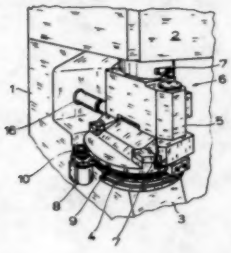


10. A cut-off machine comprising:
(A) a frame defining a work station;
(B) a ram mounted on said frame for movement through a power stroke to perform a cut-off operation on a workpiece positioned at said work station;
(C) motor means on said frame;
(D) means directing power from said motor means along two separate power trains, said two separate power trains extending between said motor means and spaced points on said ram; and
(E) synchronizing means separate from said power directing means extending between said power trains and operative to synchronize said power trains so as to synchronize the movement of said ram through said power stroke.

4,964,326
MACHINE TOOL
Karl Steinhoff, Elspe, Fed. Rep. of Germany, assignor to Muhr und Bender, Maschinenbau GmbH, Attendorn, Fed. Rep. of Germany
Filed Oct. 19, 1989, Ser. No. 424,041
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1988, 3838197
Int. Cl.[5] B26D *7/00*; B30B *15/00*
U.S. Cl. 838—559 8 Claims

6. A machine tool comprising a machine frame open at three sides and being in the approximate shape of the letter C, having upper and lower die supports disposed on said machine frame, a drive cradle disposed on the upper die support, a saddle plate disposed on the lower die support, and a tool unit, comprised of an upper die and a lower die in a guide frame, coupling means provided on the upper die support and on the saddle plate disposed on the lower die support for connection with

said tool unit, wherein said tool unit as a whole is insertable between the upper and the lower die support in the longitudinal direction of said machine frame, from the direction of the open front end, wherein said saddle plate is rotatably disposed



in the horizontal plane with respect to the lower die support, and wherein the coupling means is rotatably symmetrical on the upper die support, and the tool unit is axially coupled with the upper die support but freely rotatable with respect to said upper die support.

4,964,327

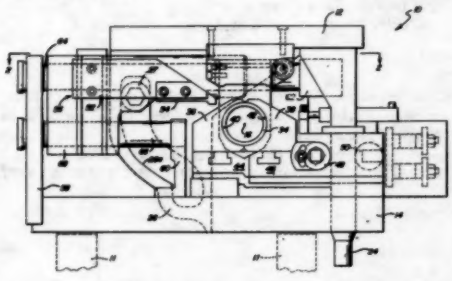
SHEARING BLADE MOUNT FOR CUT-OFF DIE SET

John H. Nolan, Mt. Clemens, and Dennis Skvarce, Wixom, both of Mich., assignors to Alpha Industries, Inc., Novi, Mich.

Continuation-in-part of Ser. No. 255,315, Oct. 11, 1988, abandoned. This application Nov. 3, 1989, Ser. No. 431,468

Int. Cl.[5] B26D *7/26*

U.S. Cl. 83—698 **3 Claims**



1. A shearing blade mount for a cut-off die set comprising:

a platen;

a mounting block adapted for mounting to said platen, said mounting block having front and rear members separated by downward opening gap;

a shearing blade cartridge including a back plate and clamp member adapted to sandwich a shearing blade therebetween;

a shaft mounted to one member of the mounting block;

eccentric means mounted to said shaft;

wedge means mounted to said eccentric to selectively contact a face of the shearing block cartridge thereby locking said blade cartridge in the mounting block

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4,964,328

NOTCHING BLADE ASSEMBLY

John H. Nolan, Mt. Clemens, and Dennis Skvarce, Wixom, both of Mich., assignors to Alpha Industries, Inc., Novi, Mich.

Filed Sep. 23, 1988, Ser. No. 249,362

Int. Cl.[5] B26D *1/60*

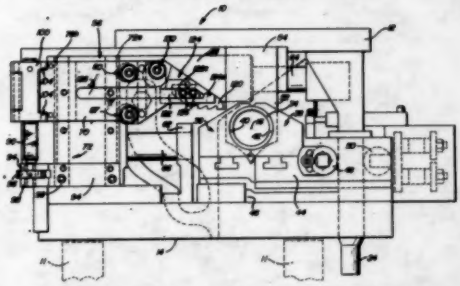
U.S. Cl. 83—698 **30 Claims**

20. A notching blade assembly for use in mounting a notching blade to the cross slide of a double cut tube cut-off die set comprising:

a cross slide;

a carriage;

a guide member, mounted on said cross slide, having opposite and a parallel side surfaces extending perpendicular to the direction of cross slide movement, the parallel side surfaces of the guide member having guide notches defining guideways extending the length thereof;



a first gib mounted to the carriage having a bearing surface engaging one complementary bearing surface of the guideway; and

a cam lock assembly mounted to the carriage engaging the opposite complementary bearing surface of the guideway, wherein said first gib and cam lock assembly secure said carriage to said guideway.

4,964,329

SOUND ATTENUATION WITH FOAM

Neville T. Moxon; Alstair C. Torrance, both of New South Wales, and Stephen B. Richardson, Blackall's Park, all of Australia, assignors to Broken Hill Proprietary Co., Ltd., Melbourne, Australia

Filed Nov. 23, 1987, Ser. No. 123,633

Claims priority, application Australia, Nov. 21, 1986, PH9109/86

Int. Cl.[5] F42B *33/00, 1/00*; C06B *21/00*

U.S. Cl. 86—50 **8 Claims**

1. A method for reducing the peak overpressure of an explosion produced by an explosive, comprising disposing adjacent to the explosive, or otherwise in the path of the shock wave of the explosion generated by the explosive, a barrier of an aqueous foam containing dispersion particulates, said dispersion particulates comprising particles predominately smaller than 200 mesh to enhance the sound attenuating capability of the aqueous foam without, substantially, destabilizing the foam.

5. A method of mining utilizing an explosive to blast a geological structure, wherein the peak overpressure of an explosion produced by the explosive is reduced by disposing adjacent to the explosive, or otherwise in the path of the shock wave of the explosion generated by the explosive, a barrier of an aqueous foam containing dispersion particulates, said dispersion particulates comprising particles predominately smaller than 200 mesh, to enhance the sound attenuating capability of the aqueous foam without, substantially, destabilizing the foam.

4,964,330

OIL FILTER ACCESSORY

Gary D. Swinney, 14 Provence, Lake Saint Louis, Mo. 63367, and Richard H. Chenot, 149 Hineman, St. Charles, Mo. 63301

Filed Oct. 10, 1989, Ser. No. 419,115

Int. Cl.[5] B25B *13/52*

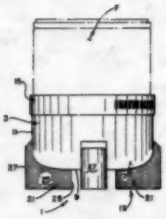
U.S. Cl. 81—64 **25 Claims**

1. An oil filter accessory to facilitate installation and/or removal of an oil filter from an automobile engine or the like, comprising:

a housing having at least one open end adapted to fit over an oil filter;

locking means operably associated with said housing for securely mounting said housing against rotation relative to said oil filter; and

hand wrenching means operably associated with said housing to enable a user to physically grip and rotate said filter in either direction for tightening or loosening same relative to said automobile engine or the like, said hand wrenching means comprising a series of spaced finger



gripping projections integral with and extending circumferentially about said housing, each finger gripping projection tapering inwardly on opposite sides thereof from an outermost surface to an innermost surface which is laterally offset from the innermost surfaces of said other projections, and each finger gripping projection also extending longitudinally beyond the housing for a sufficient distance to enable the fingers of a user's hand to grip the finger gripping projections for tightening and loosening of an oil filter relative to the automobile engine.

4,964,331

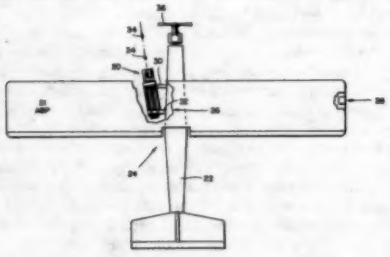
AIRBORNE BIRDSTRIKE PREVENTION DEVICE

Eyal Halevy, 6521 Tilden La., Rockville, Md. 20852, and Michael Amir, 15 Edgewood St., Worcester, Mass. 01602

Filed Dec. 29, 1988, Ser. No. 291,737

Int. Cl.[5] F41A *23/00*

U.S. Cl. 89—37.19 **10 Claims**



1. A remote control noise-generating device comprising:

a radio-controlled airplane,

a cannon firing mechanism mounted on said airplane, said cannon firing mechanism including an elongated body, tube means pivotally mounted on one end of said body for holding explosive cartridges, and firing means for detonating cartridges held in said tube, and

a transmitter for controlling said airplane and for energizing said firing means,

said body being mounted on a fuselage of said airplane at an angle to said fuselage.

4,964,332

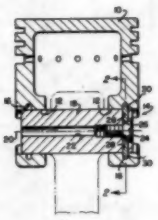
PISTON AND CONNECTING PIN ASSEMBLY, A CROSSHEAD AND CONNECTING PIN ASSEMBLY, AND A CONNECTING PIN ASSEMBLY

John A. Sawyer, Trout Run, Pa., assignor to Dresser-Rand Company, Corning, N.Y.

Filed Sep. 15, 1989, Ser. No. 407,832

Int. Cl.[5] F16J *1/14*

U.S. Cl. 92—187 **10 Claims**



1. A connecting pin assembly, comprising:

a connecting pin having (a) a longitudinal axis, (b) a hole formed in one axial end thereof; wherein

said pin further has a radial bore formed therein which opens onto said hole, at one end of said bore, and externally of said pin, at the other, opposite ene of said bore;

a locking pin slidably disposed in said bore; and

a fastener engaged with said hole; wherein

said fastener has means for moving said locking pin radially in said bore to cause said locking pin to project from said bore;

said fastener has a drive head; and

said drive head comprises said pin moving means.

4,964,333

ELLIPSOIDAL PASTEURIZER FOR FOOD MIXTURES

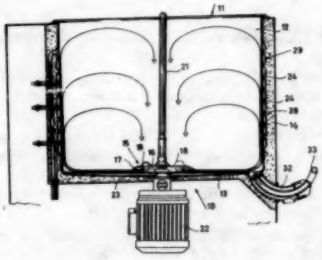
Francesco Bravo, Montecchio Maggiore, Italy, assignor to Bravo, S.p.A., Vicenze, Italy

Filed Oct. 11, 1988, Ser. No. 255,321

Claims priority, application Italy, Oct. 28, 1987, 22435 A/87

Int. Cl.[5] A23G *9/00*

U.S. Cl. 99—455 **5 Claims**



1. Pasteurizer for food mixtures of the type comprising a tank having thereon heating means and cooling means and containing mixture circulation means, and wherein the said tank (11) has an ellipsoidal shape and comprises an ellipsodally shaped bodyshell (12) for holding a food mixture that is to be pasteurized, said bodyshell having a base (13) secured to and closing the bottom thereof, and said mixture circulation means comprises a rotatable impeller device (15) mounted in said bodyshell adjacent to said base (13) and being in the form of a

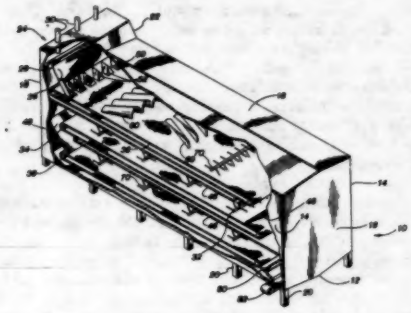
rotatable disc (16) which is slightly drawn so as to have thereon a tapered circumferential edge (17), said disc having formed upwardly therefrom a plurality of deflector tabs (18) which form corresponding aspiration ports (19) in said disc, and said disc having formed thereon below said ports centrifugal blades (20) for moving an aspirated food mixture in said tank through the ports (19), when said disc is rotated.

4,964,334

APPARATUS FOR PROCESSING CHEESE

Jeffrey L. Jay, Annandale, Minn., assignor to Scherping Systems, Inc., Winsted, Minn.

Filed Sep. 20, 1989, Ser. No. 410,073
Int. Cl.[5] A01J 25/00, 25/11
U.S. Cl. 99—459 21 Claims



1. A cheese processing apparatus for continuously processing raw cheese curd consisting of cheese curd and whey, comprising:

supply means for continuously supplying said raw cheese curd;

divider means operably coupled with said supply means for forming said raw cheese curd into a plurality of continuous ribbons, each ribbon comprising a strip of raw cheese curd and an associated strip of bare space; and

conveyor belts means for receiving said ribbons at a first location on said belt means and transporting said ribbons to a second location on said belt means while allowing the whey to drain,

whereby the drainage of the whey from the cheese curd is enhanced by the formation of the continuous ribbons.

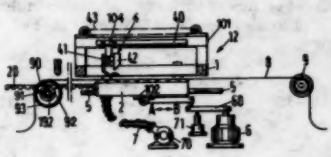
4,964,335

SCREEN PRINTING METHOD

Gerhard Klemm, Bielefeld, Fed. Rep. of Germany, assignor to Gerhard Klemm Maschinenfabrik GmbH & Co., Bielefeld, Fed. Rep. of Germany

Filed Jun. 30, 1989, Ser. No. 374,967
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1988, 3823200
Int. Cl.[5] B41F 15/08
U.S. Cl. 101—129 10 Claims

1. A method of repeatedly applying paste to a web in a screen printing machine wherein the web is intermittently advanced in a first direction along an elongated path which is flanked by a flat bed at one side and by a screen and at least one squeegee at the other side opposite the bed, comprising the steps of repeatedly advancing the web in said first direction through a relatively short first distance and simultaneously moving the bed and the screen jointly in a second direction counter to said first direction; and moving the bed and the screen subsequent to each advancing step jointly with the web in said first direction through a longer second distance and



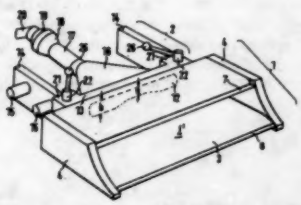
simultaneously applying paste to the web through the screen with the at least one squeegee.

4,964,336

PRINTING MACHINE WITH SEPARABLE COMPACT INKER INCLUDING A CHAMBERED DOCTOR BLADE UNIT

Georg Bock, Augsburg; Franz X. Gollinger, Hirschbach, and Thomas John, Augsburg, all of Fed. Rep. of Germany, assignors to Man Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Sep. 6, 1989, Ser. No. 403,620
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1988, 3832216
Int. Cl.[5] B41F 9/10, 31/04
U.S. Cl. 101—157 12 Claims



1. Printing machine having a compact inker comprising a chambered doctor blade unit (1) having an elongated structure (3, 4) defining therein a cavity (1) open at one side (11) and facing an inking roller (9),

said doctor blade unit (1) including at least one doctor blade (7, 8, 32) securely, essentially irremovably seated in said structure and projecting from said cavity towards the inking roller (9) for stripping ink therefrom;

a carrier element (2) for said elongated structure including attachment means (15) for coupling the carrier element to the printing machine;

releasable interlocking attachment means (22–26) on said carrier element (2) and on said elongated structure (3, 4) forming the chambered doctor blade unit for releasably coupling the entire chambered doctor blade unit (1) to the carrier element and hence to the printing machine;

an ink supply opening formed in said chambered doctor blade unit (1) and terminating in a rear or bottom wall (10) defining said cavity (1'), said ink supply opening comprising

an elongated ink supply and distribution slit (12) extending along a major portion of said elongated structure;

an ink distribution and supply connection (16) coupled to the elongated structure, fitting against the rear wall thereof, and expanding funnel-like to cover said elongated ink supply and distribution slit;

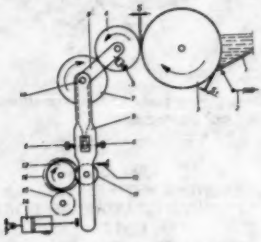
and wherein the width of said elongated slit (12) is narrower in a central region (a) thereof than at terminal regions (b) located close to the lateral ends of the ink chamber (1').

4,964,337

INK ROLLER

Daniel Bognar, Wiesbaden, and Hans-Jörg Laubscher, Frankenthal, both of Fed. Rep. of Germany, assignors to Miller-Johannisberg Druckmaschinen GmbH, Wiesbaden, Fed. Rep. of Germany

Filed May 21, 1985, Ser. No. 736,360
Int. Cl.[5] B41F *31/14, 31/34*
U.S. Cl. 101—350 12 Claims



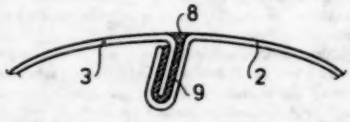
1. Apparatus for delivering fluid in a printing press, the combination including reservoir means for fluid, a fountain roller for carrying a film of fluid from said reservoir means, a combi-roller for receiving fluid from said fountain roller, a distribution roller to continuously receive fluid from said combi-roller for delivery to rollers of a printing press, and means for adjusting the relative position of the peripheral surface of said combi-roller with respect to the peripheral surface of said fountain roller to selectively locate said peripheral surfaces in a constant spaced relationship to provide continuous fluid transfer gap therebetween and in a variable spaced relationship to provide an intermittent fluid transfer gap therebetween.

4,964,338

METHOD OF MECHANICALLY JOINING THE MARGINAL PORTIONS OF A BLANK OF A PRINTING PLATE FOR ROTARY PRINTING, AND PRINTING PLATE THUS PRODUCED

Giuseppe Fantoni, Ozzano M.to, and Daniele Temporin, Casale M.to, both of Italy, assignors to Officine Meccaniche G. Cerutti S.p.A., Casale Monferrato, Italy

Filed Jan. 25, 1989, Ser. No. 301,654
Int. Cl.[5] B41F *27/06*; B41C *3/00*
U.S. Cl. 101—378 12 Claims



9. An elongated tubular printing plate having an internal surface and an external surface and including a flexible foundation sheet at said internal surface and a photosnsitive layer at said external surface, said sheet having two marginal portions extending substantially longitudinally of and disposed within the tubular plate, one of said marginal portions having an elongated pocket with an inlet at said external surface and the other of said marginal portions extending into said pocket so that said marginal portions are mechanically connected to each other; and a body of hardened filler material disposed in said inlet and providing a smooth transition between those portions of said external surface which are adjacent said inlet.

4,964,339

MULTIPLE STAGE ROCKET PROPELLED MISSILE SYSTEM

Thomas W. Bastian, Placentia, and Charles W. Schertz, Bakersfield, both of Calif., assignors to General Dynamics Corp., Pomona Division, Pomona, Calif.

Filed Dec. 23, 1987, Ser. No. 137,226
Int. Cl.[5] F42B *15/00*
U.S. Cl. 102—376 11 Claims

1. A rocket propelled missile assembly, comprising:

a boost motor having an outer casing defining a propellant chamber having a forward end within said casing and a rear end, the rear end of the propellant chamber having at leas one exhaust nozzle for venting exhaust gases from the propellant chamber, the casing having an aerodynamic fairing projection forwardly from the forward end of the propellant chamber, the fairing having an opening at its forward end;

a hollow tubular member of smaller diameter than said propellant chamber contained within said propellant chamber and having an open forward end aligned with the opening at the forward end of the fairing;

propellant material contained within said propellant chamber surrounding said tubular member and extending up to the outer wall of said tubular member;

a separate, final stage missile at least partially housed within said tubular member;

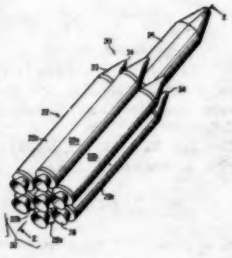
said tubular member comprising means for insulating said missile from boost motor propellant heat and for isolating said missile from boost motor propellant gases until burn out of the propellant material.

4,964,340

OVERLAPPING STAGE BURN FOR MULTISTAGE LAUNCH VEHICLES

Mark H. Daniels; Jack Funk, both of Houston; Wyendell B. Evans, Friendswood, and Christopher C. Varner, Houston, all of Tex., assignors to Space Services, Incorporated, Houston, Tex.

Filed Oct. 7, 1988, Ser. No. 254,601
Int. Cl.[5] B64G *1/40*
U.S. Cl. 102—377 60 Claims



1. A launch vehicle comprising first and second sequentially ignitible rocket motor stages, wherein each of said rocket motors stages is comprised of at least one solid rocket motor and means is provided for igniting the second stage rocket motor subsequent to vehicle lift-off while the launch vehicle is within the earth's atmosphere in partially overlapping relation-

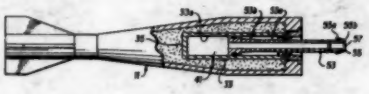
ship with the first stage rocket motor prior to termination of first stage motor operation.

4,964,341

PROJECTILE WITH RAM AIR-EXTENDIBLE PROBE AND RAM AIR-EXTENDIBLE PROBE ASSEMBLY THEREFOR

John R. Hebert, Cockeysville, Md., assignor to AAI Corporation, Cockeysville, Md.

Filed Aug. 21, 1989, Ser. No. 396,178
Int. Cl.[5] F42B *10/46*
U.S. Cl. 102—501 **9 Claims**



1. A projectile having an extendable fluid contacting slipstream forking probe in its forward end,

said probe being slidably movable forwardly within said projectile as a function of and in response to fluid pressure rearwardly acting on said forward end of said projectile,

said projectile having probe guide means at the forward end thereof and within which said probe is slidable,

said probe being peripherally smaller along its forward end zone than said guide means and being thereby substantially freely slidable along its initial forward travel within said forward end probe guide means,

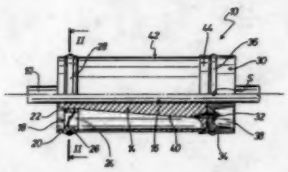
and said probe being peripherally larger than said forward end guide means and forming a force fit therewithin whereby said probe is frictionally restrictedly by said forward end zone probe guide means during a subsequent terminal portion of its forward travel within said guide means.

4,964,342

PROPULSION MECHANISM FOR A SUBCALIBER PROJECTILE

Ulrich Schleicher, Hersbruck, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Dec. 6, 1989, Ser. No. 446,998
Claims priority, application Italy, Dec. 24, 1988, 3843968
Int. Cl.[5] F42B *14/06*
U.S. Cl. 102—521 **7 Claims**



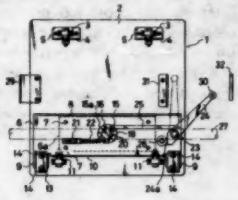
1. Propulsion mechanism for a subcaliber projectile, said propulsion mechanism being axially segmented about the circumference of said projectile and including a carrier component having a form-fitted contacting zone with said projectile, a front part being connected with the leading end of said carrier component and having forwardly facing air pocket formed therein; an axially segmented rear positioning part being connected with and extending about a rearward portion of said carrier component, said rear positioning part having axial through-apertures formed therein, and a sleevelike outer part extending between the front part and the rear positioning part so as to encompass said carrier component, said carrier component having a lower weight than said front part, said rear positioning part having a lower weight than said front part and said carrier component and being constituted from a damping material, said front part which is connected with the carrier component consisting of a material which is of a heavier specific density than the material of the carrier component.

4,964,343

PALLET IN FRICTIONALLY DRIVEN ROLLER TYPE TRANSFER APPARATUS

Hideaki Haruna, and Hiroki Azeura, both of Hyoko, Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

Continuation of Ser. No. 195,491, May 18, 1988, abandoned.
This application Aug. 4, 1989, Ser. No. 391,626
Claims priority, application Japan, Jul. 15, 1987, 62-107659; Jul. 15, 1987, 62-107660
Int. Cl.[5] B61B *13/12*
U.S. Cl. 104—166 **17 Claims**



1. A pallet driven along a pair of spaced parallel rails having a rotating drive shaft disposed parallel thereto, said pallet comprising:

an upper plate to support articles thereon for conveyance;

supporting rollers mounted on the underside of said upper plate to roll along one of said rails;

a base plate detachably mounted on said upper plate to overlap the other of said rails and said parallel drive shaft, said base plate having mounted on the undersurface thereof:

(a) supporting rollers to roll along the other of said rails,

(b) guide means positioned to engage opposite side faces of said other rail to maintain said supporting rollers in position thereon,

(c) a driven roller in driving engagement with said drive shaft so as to be rotated about the axis of rotation of said driven roller,

(d) means mounting said driven roller so that the roller axis may be adjusted between a first position in which said roller axis is parallel to said drive shaft axis and a second position in which said roller axis is transverse to said drive shaft axis, and

(e) a stop lever connected to said mounting means and having an end projecting beyond one end of said pallet to afford adjustment of said roller axis;

said driven roller operating to advance said pallet along said rails when said roller axis is transverse to said drive shaft axis and to arrest travel of said pallet along said rails when said roller axis is parallel to said drive shaft axis.

8. A pallet apparatus comprising a pair of spaced parallel rails having a rotating drive shaft disposed parallel thereto, at least two pallets driven in a path of travel along said rails by said drive shaft, and a fixed abutment positioned adjacent said rails and projectable into a position in said path of travel, each of said pallets comprising:

(a) an upper plate adapted to support articles thereon for conveyance and a base plate detachably mounted on said upper plate, said plates spanning between said rails and overlapping said drive shaft;

(b) support means on said upper and base plates supporting said pallet on and guiding said pallet along said rails;

(c) a driven roller in driving engagement with said drive shaft so as to be rotated about the roller's axis of rotation,

(d) means mounting said roller so that the roller axis may be adjusted between a first position in which said roller axis is parallel to said drive shaft axis and a second position in which said roller axis is transverse to said drive shaft axis, said driven roller operating to advance said pallet along said rails when said roller axis is transverse to said drive shaft axis and to arrest travel of said pallet along said rails when said roller axis is parallel to said drive shaft axis,

(e) a stop lever having an end projecting beyond one end of said pallet and connected to said mounting means to afford adjustment of said roller axis, said stop lever having first and second positions corresponding respectively to the first and second positions of said roller axis; and

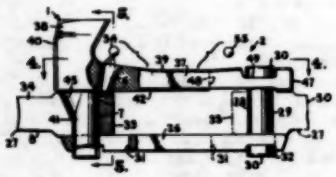
(f) the projecting end of said stop lever having an upwardly projecting actuator positioned in the path of travel of a preceding pallet on the rails and a second actuator projecting downwardly to engage said fixed abutment in its projected position, said projected position being in the path of travel of said second actuator in both the first and second positions of said stop lever, whereby said stop lever may be displaced either by the preceding pallet or by the fixed abutment, and said pallet is positively arrested by said fixed abutment in its projected position.

4,964,344

SIDE LINK PUSHER DOG WITH LUBRICATION PASSAGE

Victor G. Robinson, Irvine, Calif., assignor to Mid-West Conveyor Company, Inc., Kansas City, Kans.

Filed Apr. 28, 1989, Ser. No. 345,198
Int. Cl.[5] B61B *12/08*
U.S. Cl. 104—172.5 **18 Claims**



1. A side link member for use with a drive chain of a power and free conveyor, said chain being formed of alternating center links and pairs of side links, said side link member comprising:

(a) an elongated side link bar having opposite ends and opposite upper and lower surfaces;

(b) an integral chain connection pin extending from said lower surface of a first end of said side link bar, said pin adapted for connection of a first center link to said side link bar;

(c) connection means on a second end of said side link bar for connection of a second center link to said side link bar; and

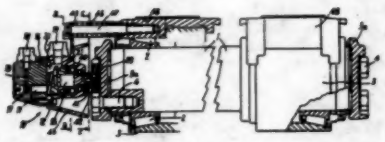
(d) a lubrication passage formed through said side link bar and positioned in spaced relation to said first end with said pin positioned between said first end and said passage, said passage located to direct lubricant surfaces frictionally engaging said pin.

4,964,345

RAIL CAR AXLE WITH AXIAL HYDRAULIC PUMP

Louis C. Porel, Rambervillers, France, assignor to Hydro Rene Leduc, Baccarat, France

Filed Dec. 8, 1988, Ser. No. 281,532
Claims priority, application France, Dec. 18, 1987, 87 17727
Int. Cl.[5] B61D *43/00*; B60K *25/08*; F04B *1/00, 9/02*
U.S. Cl. 105—96.1 **7 Claims**



1. A rail car axle arrangement comprising

at least one axle of said rail car having an end engaging portion being rotated within a first bearing means, said bearing means being supported by a frame of said rail car;

an independent pump means having a body being energized during rotation of said end engaging portion of the axle;

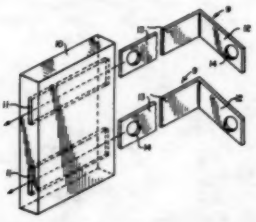
said body of the pump means being attached to said frame of the car through attaching means in such a manner that the entire weight of the pump means and stresses developed during its operation are absorbed by said attaching means and do not affect rotation of the axle.

4,964,346

COMPOSITE PEDESTAL LINER

Victor V. Kirilloff, Lincoln, Nebr.; Robert Cummins, Pittsburgh, Pa., and William A. Benson, Pittsburgh, Pa., assignors to Mosebach Manufacturing Company, Pittsburgh, Pa.

Filed Dec. 26, 1989, Ser. No. 456,537
Int. Cl.[5] B61F *5/00, 5/26*
U.S. Cl. 105—225 **6 Claims**



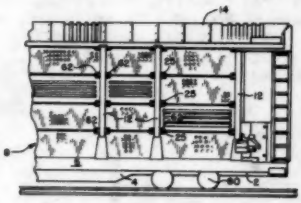
1. A pedestal liner for a railway truck having pairs of pedestal legs between each pair of which a journal box is disposed, said liner comprising a bight disposed between a leg and its associated journal box, said legs having pedestal mounting holes therethrough parallel to said bight, and mounting means affixed to said bight and overlying said pedestal mounting hole, said bight being constructed of antifriction material disposed between one of said pairs of pedestal legs and associated journal box, an aperture extending through said bight parallel with one of said pedestal mounting holes and a metal strap in the form of a right angle and having a cross section which fits within said aperture, at least one outer end of said strap having a mounting hole therethrough which is aligned with said pedestal mounting hole when the inner end of said strap is inserted into said aperture.

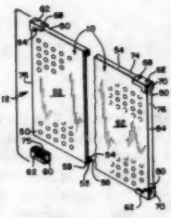
4,964,347

SIDE PANEL ASSEMBLY FOR AN AUTO RACK CAR

Russell L. Long, Greenville, and James D. Hart, Grove City, both of Pa., assignors to Trinity Industries, Inc., Dallas, Tex.

Filed Jun. 22, 1989, Ser. No. 369,764
Int. Cl.[5] B61D 17/08
U.S. Cl. 105—404 22 Claims





1. In an auto rack railway car having a body comprising a roof and an under frame structure and a plurality of upright posts interconnecting the under frame and roof,

a plurality of rectangular panels made of rust-prone metal extending between the posts and having corners including horizontal and vertical abutment surfaces contiguous to the posts;

each post having a plurality of panel-mounting brackets including horizontal and vertical abutment surfaces for holding the corners of respective panels;

said brackets having horizontal and vertical surfaces opposing corresponding panel surfaces; and

a separate corner piece jacket of flexible plastic material positioned about each of said corners and having side portions compressed between the brackets side surfaces and opposing portions of the panel corners in a substantially shakeproof arrangement.

4,964,348

DROP END, OPEN TOP RAIL CAR

Richard W. Flowers, and John R. Murray, Jr., both of Findlay, Ohio, assignors to Differential Steel Car Company, Findlay, Ohio

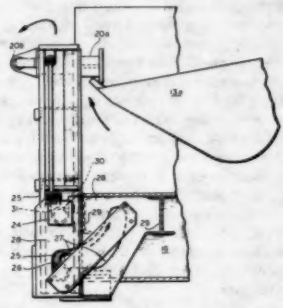
Filed Jul. 31, 1989, Ser. No. 387,490
Int. Cl.[5] B61D 9/02, 17/06
U.S. Cl. 105—406.2 16 Claims

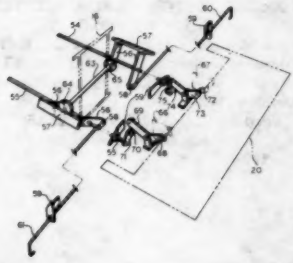
1. A railway car having a frame and a body supported thereon, said body having a floor, spaced apart longitudinal sides and opposite ends extending above said floor which define a cargo compartment for said car, said car ends being pivotally supported for movement between an upright closed position and a horizontal open position extending outwardly beyond said floor, a lower depending portion on each car end extending below said floor,

a cam fixed on said frame adjacent the car end and defining a closed path, said cam having interconnected portions comprising a first vertically extending portion and a second arcuate portion,

a follower connected on said lower depending portion of the car end and in running engagement with said cam,

a pivot on said lower portion of the car end and disposed above said follower, and





a vertical guide for said pivot, said vertical guide attached on the car frame,

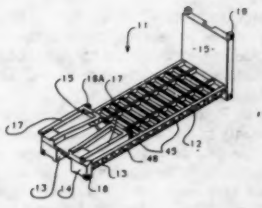
the closed path of said cam causing the car end to swing above said pivot.

4,964,349

LOAD CARRYING PLATFORMS

Frank W. Bishop, Norfolk, England, assignor to American Coastal Industries, Arlington, Va.

Filed Jan. 31, 1989, Ser. No. 304,220
Int. Cl.[5] B65D 19/44
U.S. Cl. 108—55.1 2 Claims



1. A load carrying platform comprising a rectangular planar bottom, said planar bottom having sides and ends, said sides being longer than said ends, two elongated spaced support members depending from said planar bottom parallel to the

sides and indented equidistantly from the sides, a lower wall depending perpendicularly from each of the ends of the planar bottom, each of said lower walls having a central cut out portion whereby each of said lower walls together with said elongated support members and said bottom define an essentially unobstructed elongated bridge axially along said bottom, a hinged upper wall extendable perpendicularly from at least one end of said planar bottom adjacent a lower wall, weight distribution means integral with said upper and lower walls to distribute any imposed weight onto the upper wall downwardly onto said lower wall while essentially bypassing the hinge of said upper wall, said weight distribution means including a first abutment means extending upwardly from said lower wall at the end having said hinged upper wall, said first abutment means terminating in an outwardly and upwardly facing first flat surface that is at an acute angle with respect to said lower wall and said weight distribution means including a second abutment means extending downwardly from said upper wall, said second abutment means terminating in an inwardly and downwardly facing second flat surface that is at an acute angle with respect to said upper wall whereby said upper wall rests on said lower wall through said first and second flat surfaces when said upper wall is perpendicular to said planar bottom.

4,964,350

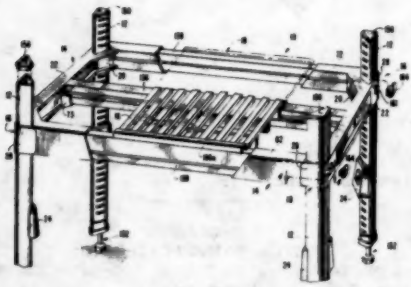
PLASTIC FRAME SYSTEM HAVING A TRIANGULAR SUPPORT POST

Albert Kolvites, Mountaintop; Robert J. Cohn, Dallas; John H. Welsch, Moscow; Willard J. Sickles, Dalton, all of Pa., and David T. Balazek, Stow, Ohio, assignors to InterMetro Industries Corporation, Wilkes-Barre, Pa.

Filed Jan. 17, 1989, Ser. No. 299,557

Int. Cl.[5] A47B *9/00*

U.S. Cl. 108—110 **36 Claims**



1. A mat subassembly for a shelving system configured to be supported by at least one beam-like supporting means, said subassembly comprising:

an upper support surface;

a plurality of ribs projecting downwardly from said upper support surface, spaced from the outer edge of said shelf, and including an outer peripheral wall facing the outer edge of said shelf;

an outer web formed between said outer peripheral wall of said plurality of ribs and the outer edge of said shelf; and

a flange projecting downwardly from the outer edge of said upper support surface, wherein said flange, said outer web, and said outer peripheral wall together comprise channel-defining elements that define an outer channel for engaging said supporting means, one of said supporting means and at least one of said channel-defining elements being formed with an elastic lug and the other thereof being formed with a complementary surface complementary to said lug, one of said lug and said complementary surface being formed with fillet means and the other thereof being formed with bead means configured to engage said fillet means;

whereby said subassembly and said supporting means may be friction fit together with said bead means engaging said fillet means.

4,964,351

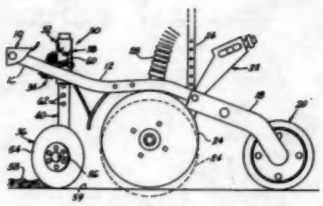
DRY SOIL SPREADER FOR DISK FURROW OPENER

Joe H. Elmenhorst, Rte. 1 Box 159, Moran, Kans. 66755

Filed Oct. 2, 1989, Ser. No. 415,501

Int. Cl.[5] A01C *5/06*; A01B *35/28*

U.S. Cl. 111—140 **1 Claim**



1. An agricultural drill having a frame and a pair of trailing arms pivotally connected with the frame in trailing relation for vertical pivoting movement and supporting furrow opening seed planting disks forwardly of a press wheel and maintained at a selected elevation with respect to the surface of the earth by a depth control strut, the improvement comprising:

soil parting means disposed forwardly of said furrow opening disks;

telescoping sleeve means including an outer sleeve and an inner sleeve connecting said soil parting means to said arms for maintaining said soil parting means at a selected elevation relative to said furrow opening disks, said soil parting means including a pair of opposed forward disks journalled on horizontal axles fixed to the depending end portion of said sleeve means for respectively moving dry soil laterally with respect to the center line of travel of said furrow opening disks;

pin means securing said sleeves in a selected telescoped position; and,

means including a clamp for connecting said sleeve means with said arms,

said clamp means including a pair of links secured to opposing sides of one said sleeve for contiguous contact with an intermediate portion of the inwardly disposed surfaces of said arms, a pair of clamp members extending transversely of one end portion of said pair of links and an intermediate portion of said arms in respective overlying and underlying relation, and, bolt means joining said clamp members in arm gripping relation.

4,964,352

EMBROIDERY DATA PROCESSING SYSTEM FOR AUTOMATIC SEWING MACHINE

Masaaki Yokoe, Nagoya; Yoshikazu Kurono, Aichi; Koji Hayashi; Tomoe Takagi, both of Nagova; Narihiro Matsushita, Kasugai, and Yuzo Takagi, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 6, 1989, Ser. No. 432,455

Claims priority, application Japan, Nov. 11, 1988, 63-286219; Nov. 18, 1988, 63-293253

Int. Cl.[5] D05C *5/04, 9/04*

U.S. Cl. 112—103 **18 Claims**

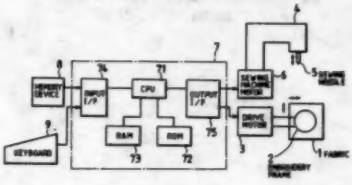
1. An embroidery data processing system for determining stitching points defining an embroidery pattern to be stitched with a thread, wherein the embroidery pattern is divided into a plurality of blocks, each having an outer profile defined by at

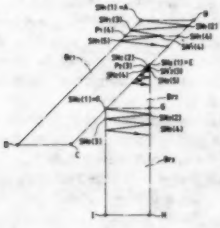
least three sides, and the stitching points are determined with respect to each of the plurality of blocks, comprising:

first memory storage means for storing side information indicating vertex positions along sides of each of the plurality of blocks;

second memory storage means for storing thread density information indicating a thread density of the embroidery pattern in each of the plurality of blocks;

third memory storage means for storing in/out displacement





information indicating stitching points to be displaced inward or outward with respect to a preselected side of one of the plurality of blocks; and

control means for calculating the displaced stitching points depending on the thread density information and the in/out displacement information with respect to the preselected side of one of the plurality of blocks, and for calculating the stitching points to be formed along the remaining sides of the plurality of blocks depending on the side information.

4,964,353

WINDSURFER SAIL

Vincent A. Morrelli, 3953 Transport St., Ventura, Calif. 93003

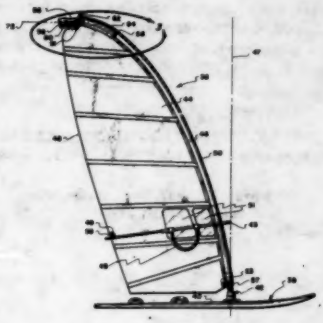
Filed May 8, 1989, Ser. No. 348,377

Int. Cl.[5] B63H *9/06*

U.S. Cl. 114—39.2 **6 Claims**

1. A sail for a windsurfer, said windsurfer including a sailboard adapted to float on water, said sailboard having a substantially planar upper surface on which a human operator is to stand, said sail having a sail body, said sail body having a foot edge, said foot edge being located directly adjacent said sailboard, said sail body having a luff edge and a leech edge, a mast, said mast defining a main section and a tip section, said tip section located at said free end of said mast, said sail body attached to said mast at said luff edge, the improvement comprising:

said tip section having a first longitudinal center axis, said tip section intersects said leech edge, at said intersection with said leech edge said first longitudinal center axis being substantially parallel to said upper surface of said sailboard; and



said main section having a second longitudinal center axis, said mast being smoothly arcuately shaped.

4,964,354

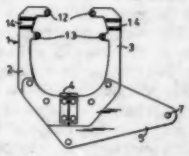
STEERING PLATE FOR OUTBOARD MOTOR

Robert P. Latham, 280 SW. 32nd Ct., Fort Lauderdale, Fla. 33301

Filed Apr. 30, 1990, Ser. No. 516,185

Int. Cl.[5] B63H *25/00*

U.S. Cl. 114—144 R **2 Claims**



1. A steering attachment apparatus for connecting the driven end of a steering actuator to a marine protrusion unit having an engine mounted above a driveshaft with multiple fasteners and a seal forming a water-tight joint between the engine mounting and a driveshaft housing enclosing the driveshaft, the unit adapted to be pivotally mounted on a boat transom for pivotal movement relative to the transom about a steering axis, the steering attachment apparatus comprising:

(a) a port side member and a starboard side member, each having broad, flat upper and lower faces and an inner edge shaped to conform to the contour of said driveshaft housing for fitting against the port and starboard sides and the rear of said driveshaft housing below said joint, said side members meeting each other at the rear of said housing;

(b) each said side member having a first aperture extending between said upper and lower faces adjacent said inner edge and arranged to receive a fastener joining said engine mounting to said housing at a point on the fastener where said fastener extends below said housing to provide secure attachment of said side members in a first plane transverse to said driveshaft without disturbing the integrity of said joint;

(c) a rear member having a first planer portion joined substantially at right angles to a second planar portion, said first planar portion arranged for connection to the lower faces of both said side members, said second planar portion arranged to adjoin a rear surface of said housing and provided with fastener receiving means for receiving at

least one fastener means for securely fastening said second portion to the rear surface of said housing; and

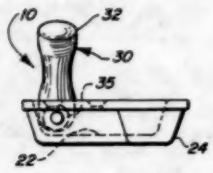
(d) a steering plate having connecting means for connecting to both said side members and said rear member, said steering plate provided with a receiving element for attachment of said driven end of said steering actuator.

4,964,355

FLUSH MOUNTED COLLAPSIBLE CLEAT

Charles M. Mlewski, 1500 SW. 17th St., Ft. Lauderdale, Fla. 33312

Filed May 27, 1987, Ser. No. 54,841
Int. Cl.[5] B63B *21/04*
U.S. Cl. 114—218 **9 Claims**



1. A cleat assembly designed for use on a marine craft or dock structure for the retention of a line and securing the marine craft to the dock, said assembly comprising:

(a) a base formed of a rigid material and of an integral, one-piece construction and including a cavity defining an interior portion of said base,

(b) a mounting flange integrally secured to said base and including a substantially planar configuration and an outer exposed surface, said mounting flange extending outwardly from said cavity in continuously surrounding relation about a periphery of said cavity,

(c) said cavity comprising a wall structure depending downwardly from said mounting flange and including an inner surface defining interior boundaries of said cavity and an outer surface,

(d) a cleat member formed of a one-piece construction and including a support arm and mounting portion integrally secured to one another,

(e) said cavity comprising a depth substantially equal to a thickness of said cleat member, said cleat member including one side face thereof being substantially flush with said outer exposed surface of said mounting flange when said cleat is in a stored position within said cavity,

(f) a pivot pin securing said cleat to said base and secured to said base beneath said mounting flange and within said cavity and extending substantially parallel to a length of said support arm,

(g) said mounting portion pivotally mounted on said pivot pin and including at least one end of said mounting portion disposed immediately adjacent said inner surface of said cavity in cooperative relation thereto,

(h) at least one friction member disposed in interconnecting and concurrently engaging relation with both said one end of said mounting portion and said inner surface of said cavity and dimensioned to removably maintain said cleat member in either said stored position or an operative position when initially so positioned,

(i) said mounting portion, said inner surface of said cavity and said friction member cooperatively disposed to transfer force exerted on said support arm at least partially to said mounting flange and a remainder of said base when force is exerted on said support arm,

(j) said operative position defined by said cleat member protruding outwardly from said cavity above and in substantially upwardly transverse relation to said mounting flange, and

(k) said cleat member dimensioned to receive the line thereon when in said operative position.

4,964,356

UNDERWATER TOWED BODY STABILIZING DEVICE

Michael J. Sullivan; Douglas G. Dussault, both of Oakdale, and Daniel Dinsmore, Jr., East Lyme, all of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 22, 1989, Ser. No. 373,539
Int. Cl.[5] B63B *39/02, 21/66*
U.S. Cl. 114—244 **6 Claims**

1. A stabilizing device for a body towed by a tow cable against the rolling motion thereof caused by an imbalanced torque in the tow cable, said stabilizing device includes:

connection means for allowing said towed body to roll freely due to imbalanced torque of the tow cable and thus correcting against major portion of the imbalanced torque in the tow cable;

an extendable keel weight housed inside said towed body for providing a righting torque on the towed body to make the acoustic sensor look upward; and

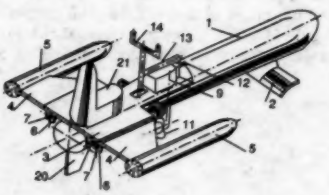
means for moving said movable keel weight in response to said residual rolling motion of said towed body.

4,964,357

PLANING BOAT

German S. Genfan, Worcester, Mass., assignor to James T. Merchant, Worcester, Mass.

Filed Jun. 6, 1989, Ser. No. 362,080
Int. Cl.[5] B63B *1/22, 1/32, 43/14*
U.S. Cl. 114—274 **6 Claims**



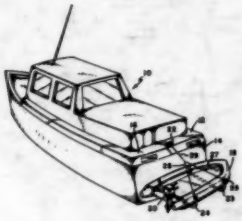
1. A planing boat comprising: a tube-like hull means having a rounded nose and a deck portion formed at a top rear section of the hull means, a steerable propeller housing means including an outboard type motor means mounted on the hull means deck portion with an attached propeller means extending downwardly through the hull means, a pair of outboard wing-like plate means with attached wing-float structures hinged to the hull means at each side of the hull means deck portion, steering lever means extending from inside the tube-like hull means upwardly through the deck portion, first means kinematically connecting each said plate means with the steering lever means for lifting and lowering the plate means and attached wing-float structures, and second means kinematically connecting the steering lever means with the propeller housing means for rotating the housing means and attached propeller means around a vertical axis arranged in a plane which is in line with the full-loaded boat center of gravity.

4,964,358

SMALL BOAT HOISTING APPARATUS AND METHOD

Martin S. Sandrow, 76 C Elizabeth Ave., Somerset, N.J. 08873

Filed Mar. 22, 1989, Ser. No. 327,293
Int. Cl.[5] B63B *23/02*
U.S. Cl. 114—368 5 Claims



1. Rigging apparatus for securing to the aft end of a vessel, for recovery from the water and stowing on said vessel, a small craft or dinghy comprising:

(a) a pair of arms for supporting a small craft in an upright position and at the underside of the small craft, said arms extending rearwardly from the vessel in a line which is parallel to the line of the keel of said vessel, and at the stern of the vessel, and being pivotally mounted on the vessel, said arms being devised such that when one end of the arms in relation to the other end of the arms is pivoted downward from a horizontal position, one end of the arms is partially submerged in the water and when in the thus submerged position facilitate the floating directly onto said arms and securing thereon of a small craft, and

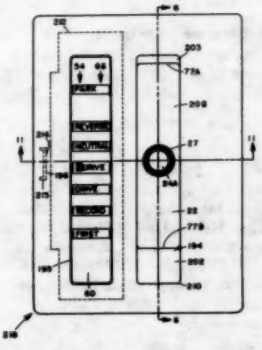
(b) hoisting means on said vessel connected to said arms, at a point on said arms aft of the pivotable mounting point of said arms on the vessel, to lower the remote end of the small craft supporting arms, and to raise the arms from a thus lowered position to a horizontal stowing position for the small craft.

4,964,359

AUTOMOTIVE GEARSHIFT INDICATOR

James W. Richmond, Carmel, Ind., assignor to Emhart Industries, Inc., Towson, Md.

Filed Dec. 22, 1988, Ser. No. 288,226
Int. Cl.[5] G09F *9/00*
U.S. Cl. 116—28.1 7 Claims



1. A gear shift lever operating position indicating mechanism comprising:

a housing having a window in it and having aperture means for passing said shift lever through it, said housing including a body portion and a cover portion;

indicia means for labeling the operating positions of said gear shift lever;

an indicting arm; and

arm support means for movably supporting said indicating arm within said housing over a range of movement that permits the arm to be visually aligned in said window with said indicia means, said arm support means including:

tape means for moving with said lever to close said aperture means and for connecting said indicating arm to said lever, whereby said arm moves with said lever to indicate the operating position of the lever;

tape support means for permitting movement of said tape along an axis while relatively rigidly supporting it in a first direction substantially perpendicular to said axis;

a flange integrally formed with and at right angles to said arm;

channel means extending from said tape to said cover to receiving said flange; and

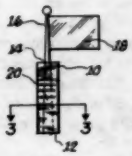
fastening means for securing said cover to said body and preventing movement of said flange in a second direction opposite to said first direction, whereby said flange is constrained to move in said channel between said cover and said tape thereby supporting said arm while permitting it to move along said axis.

4,964,360

AUTOMOBILE LOCATOR

James G. Henry, 9881 NW. 6th Ct., Plantation, Fla. 33324

Filed Oct. 27, 1989, Ser. No. 428,108
Int. Cl.[5] G09F *17/00*
U.S. Cl. 116—28 R 8 Claims



1. A device to aid in locating a car in a parking lot and display messages of the user's choice, comprising:

(a) a tubular casing having an open lower end and an enclosed upper end and having sufficient size and shape to enclose a car antenna after being placed over said antenna such that said device is quickly and easily removable from said car antenna, without disassembling said device, said device being a means to visually attract attention or display a message in areas removed from said car;

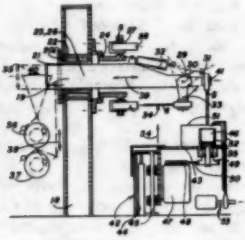
(b) means for visually attracting attention selected from the group consisting of flags, banners, pennants, and streamers; and

(c) means for connecting said means to visually attract attention to said enclosed end of said casing comprising a rigid, substantially elongated support, having a top end, a bottom end, and a shaft, said support being rigidly connected at said bottom end to said enclosed upper end of said casing, said support protruding substantially upward from said enclosed upper end of said casing, and further comprising means to attach said means to visually attract attention to said support along said shaft of said support.

4,964,361
DEVICE FOR VARNISHING THE INSIDE HOLLOW BODIES

Rene Aebersold, Villars-sur-Glane, Switzerland, assignor to Polytype AG, Fribourg, Switzerland

Filed May 10, 1988, Ser. No. 192,384
Claims priority, application Fed. Rep. of Germany, May 13, 1987, 3715969
Int. Cl.[5] B05B *15/02*
U.S. Cl. 118—302 7 Claims



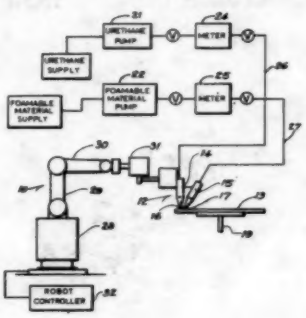
1. A device for spraying material in the interior of hollow bodies which are supplied continuously by a delivery system into a hand-over station of a rotating drum, the hollow bodies, after being coated with the material, are guided into a guiding away system through a receiving head, the device comprising said rotating drum, a spray nozzle supporting mechanism mounted for rotational movement alongside and substantially synchronized with said rotating drum, a plurality of spray nozzles having means for spraying the material therefrom, a pivot joint pivotally mounted on said spray nozzle supporting mechanism and carrying one of said spray nozzles, said pivot joint having means for pivoting said one of said spray nozzles to position said one of said spray nozzles selectively between a first position aligned with a second hollow body to be coated on said rotating drum, and a second position at an angle spaced from the first position, a purification plant located alongside said revolving drum including means for cleaning said spray nozzles, said pivot joint being movable with said one of said spray nozzles to position said one of said spray nozzles into an operative area of said purification plant.

4,964,362
APPLICATOR FOR MOTOR VEHICLE GLASS ADHESIVES AND SEALANTS

Gilbert Dominguez, W310 S7772 Arbor Dr., Mukwonago, Wis. 53149

Filed Dec. 13, 1988, Ser. No. 283,785
Int. Cl.[5] B05C *1/02, 9/06*
U.S. Cl. 118—315 14 Claims

1. Apparatus for simultaneously applying a first bead of a first adhesive and sealant material and a second bead of a second sealant material to a glass article to be installed as a window, said apparatus including a first nozzle means for discharging the first adhesive and sealant material through a shaped opening onto one surface of the glass and a second nozzle means disposed adjacent to and offset from said first nozzle means for discharging the second sealant material onto said surface adjacent to, spaced from and parallel to the first adhesive and sealant material, means for producing relative translation between the glass and said nozzles, said first nozzle means being suitable for discharging a bead of the first sealant and adhesive material as the nozzles or glass are translated and said second nozzle means being suitable for discharging the

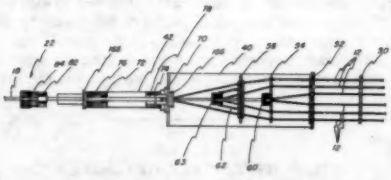


second sealant material in a second bead adjacent to, parallel to, and uniformly spaced from the first bead.

4,964,363
SYSTEM OF ASSEMBLY AND FILLING LARGE CABLES IN A SINGLE PASS AT A SINGLE STATION

Punam M. Patel, Rock Hill, S.C., and Bruce G. Kaemmer, Waxhaw, N.C., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Jun. 6, 1989, Ser. No. 362,173
Int. Cl.[5] B05C *3/02*
U.S. Cl. 118—405 9 Claims



1. A system for assembling and filling a large cable at a single station in a single pass, the system comprising:

means for converging and filling with a filling compound a plurality of unfilled small pair count cables to form a large cable;

means for filling the large cable with a filling compound at high temperature under pressure; and

wiping means for wiping the assembled and filled large cable as the large cable exits the means for filling the large cable.

4,964,364
APPARATUS FOR COATING A WEB WITH COATING MIX

Anssi Kärnä, Inkeroinen; Jukka Heikkinen, Kerava, and Juhani Eskelinen, Helsinki, all of Finland, assignors to Valmet Paper Machinery Inc., Helsinki, Finland

Filed Jan. 27, 1989, Ser. No. 302,453
Claims priority, application Finland, Jan. 29, 1988, 880420
Int. Cl.[5] B05C *3/12*
U.S. Cl. 118—410 4 Claims

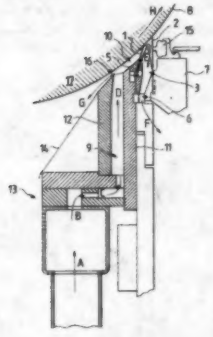
4. A short-dwell coater for coating a web with a coating mix against a rotating backing roll, comprising:

a support structure,

a feeder means adapted to the support structure for feeding coating mix into an application zone formed between the backing roll and the support structure,

an actual doctor blade, adapted to the support structure and arranged to press against the web, with which blade the excess coating mix approaching from the application zone can be removed,

a separate predoctoring blade, which is placed at a short distance before the actual doctor blade to press against the web in a similar manner for smoothing out disturbances in the coating mix flow before the mix proceeds up to the actual doctor blade, and the predoctoring blade



and the actual doctor blade are attached to a clamp between parts and of the support structure by means of such an intermediary piece placed between the blades that determines the spacing between the blades and has gaps for removal of excess coating mix entering between the blades.

4,964,365

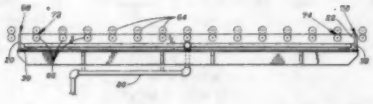
IMMERSION PROCESS MACHINE

Mark D'Amato, Montreal, Canada, assignor to D.E.M. Controls of Canada, Montreal, Canada

Continuation-in-part of Ser. No. 267,044, Nov. 3, 1988, Pat. No. 4,895,099. This application May 26, 1989, Ser. No. 357,974

Int. Cl.[5] B05C *3/12*

U.S. Cl. 118—419 **13 Claims**



1. An immersion process machine for immersing circuit boards in a liquid, said immersion process machine comprising:

a circuit board conveyor comprising a plurality of vertically opposed roller pairs aligned along a predetermined conveyor path, each said roller pair comprising an upper roller and a lower roller positioned so that a horizontally disposed circuit board may pass therebetween;

an immersion pan positioned adjacent a portion of said conveyor along said predetermined path, at least a portion of said conveyor extending into said pan, said pan being formed to hold at least a first quantity of said liquid, said immersion pan comprising:

a floor panel disposed horizontally beneath said conveyor, said floor panel having first and second longitudinal ends; and

first and second end panels attached to and extending upwardly from said floor panel;

a liquid supply assembly associated with said immersion pan operable to infuse said liquid into said immersion pan in a manner providing a continuous turnover of said liquid throughout said immersion pan to avoid stagnant areas of liquid within said pan, said liquid supply assembly comprising at least one pipe member disposed in a substantially horizontal plane above said floor panel and beneath said conveyor, said at least one pipe member having a plurality of apertures formed therein; and

a liquid supply line fluidly attached to said at least one pipe member and operative to infuse liquid through said at least one pipe member and into said pan at a first infusion rate.

4,964,366

APPARATUS FOR THE PRODUCTION OF PHOTOCONDUCTIVE COMPONENTS FOR USE IN ELECTROPHOTOGRAPHY

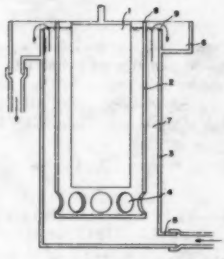
Makoto Kurokawa; Yoshihide Shimoda, and Shuhei Tsuchimoto, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 27, 1988, Ser. No. 263,401

Claims priority, application Japan, Oct. 30, 1987, 62-277000

Int. Cl.[5] B05C *3/02*

U.S. Cl. 118—429 **6 Claims**



1. An apparatus for the production of photoconductive components for use in electrophotography, comprising:

a coating tank having an overflow weir at a top end thereof and a coating-supply opening at a lower portion through which a coating material is supplied to said coating tank;

a chamber defined by the perimeters of the tank and communicating with said coating-supply opening;

a partition means positioned in said chamber between the inner wall of said tank and the outer surface of an electric conductor to be coated with the coating material, said partition means being provided with a plurality of holes covered with a mesh filter and disposed at a lower portion thereof through which said coating material is supplied to and removed from the inside of the partition means, whereby when an electric conductor to be coated is immersed in said coating material and removed from said coating material, the occurrence of turbulent flow being created in said coating materials in the vicinity of said electric conductor is substantially prevented.

4,964,367

ADHESIVE APPLYING MACHINE

Robert F. Belter, Akron, Ohio, assignor to R.F. Belter Corporation, Akron, Ohio

Filed Aug. 14, 1989, Ser. No. 393,588

Int. Cl.[5] B05C *1/04*

U.S. Cl. 118—667 **13 Claims**

1. An adhesive applying machine, comprising;

a pan for receiving adhesive wax therein;

a roller rotatable within said pan;

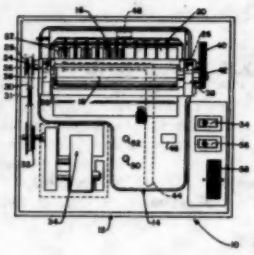
drive means connected to said roller for selectively rotating said roller about an axis;

heating means connected to said pan for heating wax re-

ceived within said pan, said heating means selectively inhibiting operation of said drive means;

a plurality of thermal fuses interposed within said pan and interconnected between a power source and said drive means and heating means; and

wherein said heating means comprises a first switch interconnected with a heating element received by said pan



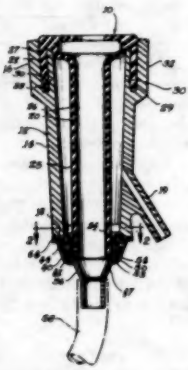
and a first thermostatic switch interposed between said heating element and said pan for maintaining adhesive wax within said pan at a set temperature, and said drive means comprises a second switch interconnected with a motor connected to said roller, said first and second switches being in series connection with the power source.

4,964,368

MILDING TEAT CUP HAVING EXTENDED LINER-SHELL SEAL

Robert C. Ball, Cambria, Wis., and Paul G. Germain, Bridgman, Mich., assignors to Versa Medical Technologies, Inc., Portage, Wis.

Filed Sep. 29, 1989, Ser. No. 415,072
Int. Cl.[5] A01J *5/04*
U.S. Cl. 119—14.49 **11 Claims**



1. A teat cup assembly for use in an automatic milking system, a teat cup assembly having proximal and distal ends including

a shell having a teat receiving distal end and a proximal end, and

a flexible inflation adapted to be joined at its proximal and distal ends to the assembly with fluid seal fits,

the assembly at its proximal end comprising

a collection cap funnel,

an extension bushing adapted to engage and retain the proximal end of the inflation in the collection funnel with a fluid seal fit, and

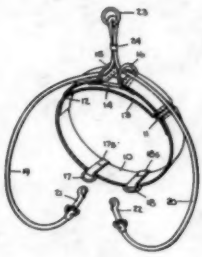
spacing means for engaging and centering the extension bushing and inflation in the funnel and for engaging the shell so as to axially distend and secure the inflation between the extension bushing and collector funnel.

4,964,369

STRAIN-REDUCING DOG HARNESS

Joseph S. Sporn, 274 W. 86th St., #4B, New York, N.Y. 10024

Filed May 11, 1990, Ser. No. 522,093
Int. Cl.[5] A01K *15/00, 27/00*
U.S. Cl. 119—96 **7 Claims**



1. A dog harness adapted to control a dog so that it does not strain against a leash coupled to the harness, said harness comprising:

(a) a collar adapted to encircle the neck of the dog and having a front section and a rear section, said rear section having a pair of slip rings linked thereto at its center; and

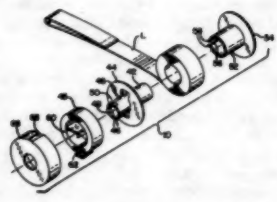
(b) a pair of restraint cables whose trailing ends terminate in a coupler to which the leash is attachable, the cables running through the respective slip rings and from there over the shoulder of the dog and under its forelegs, the cables having leading ends which are attachable to left and right sites on the front section of the collar, whereby when the leash is unstrained, the cables are loose and when strained the cables are tightened to impose a pressure on the sensitive foreleg pits of the dog, causing the dog to relieve the strain.

4,964,370

LEASH RETRACTOR

Edwin R. Peterson, 4420 Hillcrest, Boise, Id. 83705

Filed Jul. 31, 1989, Ser. No. 386,945
Int. Cl.[5] A01K *27/00*
U.S. Cl. 119—109 **15 Claims**



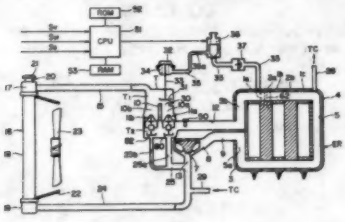
1. A leash retractor comprising a housing, a retractor subassembly retained in said housing by a cover having a press fit connection with said housing, a main spool in said housing, a leash spool having a press fit connection with said main spool, a coil spring on said main spool, and a spring retainer having a press fit and lock connection with said main spool.

4,964,371

AUTOMOBILE ENGINE COOLING SYSTEM

Toshimasa Maeda, Higashihiroshima, and Hidenobu Sato, Hiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 4, 1989, Ser. No. 333,018
Claims priority, application Japan, Apr. 4, 1988, 63-81430
Int. Cl.[5] F01P 7/14
U.S. Cl. 123—41.1 38 Claims



1. A cooling system for an internal combustion engine having a radiator connected to said engine by way of a circulation passage for cooling and circulating engine coolant through said engine, said cooling system comprising:

first and second valve means disposed in parallel to each other in said circulation passage, said first valve means being adapted to be open at temperatures higher than a first predetermined opening temperature at which said first valve means starts opening while said engine is operated in high engine load range, and said second valve means being adapted to start opening at a second predetermined opening temperature higher than said first predetermine opening temperature for said first valve means;

at least one bypass passage branching off from said circulation passage for allowing engine coolant leaving said engine to reenter into said engine while bypassing said radiator; and

bypass valve means for closing said at least one bypass passage at a temperature between said first and second predetermined opening temperatures for said first and second valve means

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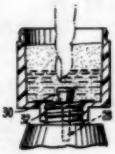
4,964,372

FINGERNAIL TREATING DEVICE

Joseph Zeenni, 30 Churchill Lane, Amsterdam, Netherlands, and Antoine Duceppe, 6472 Boul. des Roseraies, Ville D'Anjou, Quebec, Canada H1M 2S2

Filed Aug. 7, 1989, Ser. No. 390,103
Int. Cl.[5] A45D 29/18
U.S. Cl. 132—74.5 5 Claims



1. A device for treating fingernails comprising:

a container having first and second compartments;

a liquid metering means disposed between the compartments;

a liquid absorbing member disposed in the first compartment;

said liquid absorbing member having defined therein a finger receiving means;

a fingernail treating liquid disposed in the second compartment;

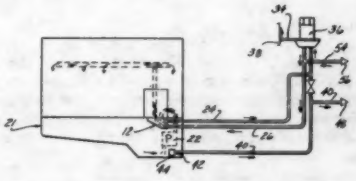
said second compartment having a squeezable side wall whereby, upon squeezing, an amount of liquid is forced into the first compartment through the liquid metering means.

4,964,373

PROCESS FOR SIMPLE AND HIGH SPEED OIL CHANGE AND/OR FLUSHING THE ENGINE OIL DISTRIBUTION CHANNELS OF THE MOVING COMPONENTS OF THE CRANKCASE IN AN INTERNAL COMBUSTION ENGINE

Ram Bedi, Birmingham, Mich., assignor to K. J. Manufacturing

Continuation-in-part of Ser. No. 350,303, May 11, 1989, Pat. No. 4,884,660. This application Sep. 26, 1989, Ser. No. 413,008
Int. Cl.[5] F01M 1/00
U.S. Cl. 123—196 R 8 Claims



1. A device for facilitating flushing and scrub cleaning of moveable parts in an internal combustion engine having an oil pan with a drain plug opening an internal lube oil distribution passage system, comprising:

an oil filter adapter adapted to be sealingly connected to an engine oil filter mounting boss located on the internal combustion engine, said adapter having at least two nozzles, a first nozzle in fluid communication with an engine oil pump located in the oil pan and a second nozzle in fluid communication with the internal lube oil distribution passage system of the engine;

a remote oil filter mounting boss having first and second apertures and a mounting bracket attached thereto, said mounting bracket positioned on the engine remote from said engine oil filter mounting boss;

an oil filter removably mounted on said remote oil filter mounting boss;

a first inlet hose connected to said first nozzle and said first aperture of said mounting bracket;

a second outlet hose connected to said second nozzle and said second aperture on said mounting bracket;

a pump-out line connected to the drain plug opening having a coupling member at a remote end, said coupling member adapted to removably contact an external pump device; and

a fill line connected to said second outlet hose said fill line having a coupling member attached at a remote end, said coupling member adapted to removably contact said external pump device.

4,964,374

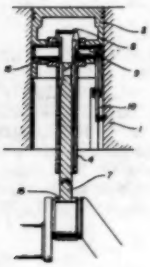
RECIPROCATING PISTON INTERNAL COMBUSTION ENGINES AND LIKE MACHINES

Vasant M. Joshi, 4/49 Vishnu Prasad, M.G. Road, Post Office Vile Parle (East) Bombay 400 057, Maharashtra, India

Filed Apr. 11, 1989, Ser. No. 336,067
Int. Cl.[5] F02B 75/32
U.S. Cl. 723—197 AB 20 Claims

1. A machine with at least one reciprocating piston comprising: at least one crankshaft with at least one crankpin, at least one cylinder which is provided with components including a piston, a connecting arm journaled to the piston, a bearing

block assembled around the crankpin of the crankshaft and which connects to the connecting arm and a locking device; characterized in that there are provided means for lockably engaging the bearing block and the connecting arm, by the use of the locking device, in one operating mode, means for enabling freedom of relative movement between the bearing block and connecting arm in a second operating mode, and means for selectively changing between the two operating modes, in synchronism with both the piston and the crankpin being either at, or approximate to their top or bottom center positions.



4,964,375

VALVE OPERATING MECHANISM

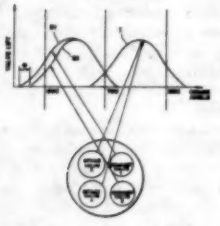
Satoshi Takeyama, and Yasuo Matsumoto, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

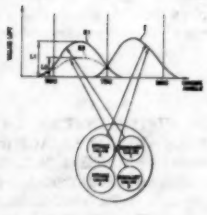
Filed Dec. 7, 1988, Ser. No. 280,856

Claims priority, application Japan, Dec. 8, 1987, 62-187044[U]; Dec. 15, 1987, 62-317190; Dec. 15, 1987, 62-190257[U]

Int. Cl.[5] F02B *15/00*

U.S. Cl. 123—315 **13 Claims**





1. A valve operating mechanism for an internal combustion engine having a plurality of exhaust valves per cylinder, comprising:

means for driving at least one of said exhaust valves at a variable valve timing and lift than remainder said exhaust valves in a same cylinder; and

means for controlling said driving means so as to vary the valve timing and lift of said at least one exhaust valve in accordance with variations in operating condition of said engine.

4,964,376

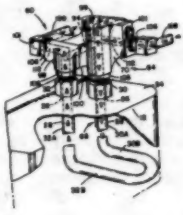
DEVICE FOR BYPASSING HEAT EXCHANGE CONDUITS

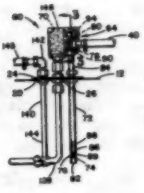
Jack R. Veach, Maple Plane, and Alden C. Helleksen, Mound, both of Minn., assignors to Arctic Fox Heaters, Hopkins, Minn.

Filed Oct. 3, 1989, Ser. No. 420,601

Int. Cl.[5] F02M *31/16*

U.S. Cl. 123—557 **35 Claims**





1. A system for controlling the flow of a heat exchange medium within a heat exchange conduit positioned in a reservoir tank for containing liquids; said control system being mounted across an access opening in a top portion of said reservoir tank, and said control system comprising:

(a) mounting means for securely positioning said heat exchange control system across an access opening in a reservoir tank for liquids;

(b) a heat exchange conduit flow being controlled by said heat exchange control system for permitting heat exchange within said reservoir tank; said heat exchange conduit comprising a length of rigid tubing passing into and out of said reservoir tank through said access opening, said rigid tubing including an inlet section and an outlet section interconnected to one another and extending generally parallel to one another, said inlet and outlet sections each including a first portion extending generally downward into said reservoir tank and a second portion transverse thereto and extending adjacent a bottom portion of said reservoir tank;

(c) temperature sensing means for sensing temperature of liquid within said reservoir tank;

(d) bypass means for selectively admitting flow of heat exchange medium into said heat exchange conduit, said bypass means responsive to said temperature sensing means for admitting flow of heat exchange medium to said heat exchange conduit when sensed temperature is at a predetermined minimum value and alternatively bypassing said heat exchange conduit when said temperature exceeds a predetermined maximum value;

(e) conduit means for connecting said heat exchange conduit and said bypass means in fluid communication with a heat exchange medium source, said conduit means including an intake conduit and a discharge conduit;

(f) an elongate rigid tube having a closed first end section extending downwardly into said reservoir tank from said access opening, and an upper second end section extending through said access opening and an aperture in said mounting means; said temperature sensing means being fixedly located in said elongate tube closed first end section and comprising therein temperature-responsive piston means having a movable piston element; said elongate rigid tube also containing a positioning bar constructed and arranged with a first end located on said movable piston element, and an oppositely disposed second end; said positioning bar moving axially within said rigid tubing between first and second positions in response to piston element movement;

(g) biasing means providing biasing force against said bypass means and positioning bar second end so that said bypass means admits flow of heat exchange medium into said heat exchange conduit in response to movement of said positioning bar between said first and second positions;

(h) manifold means having a body section with a top portion, a bottom portion, and side portions:

(i) said bottom portion including three apertures therein constructed and arranged for receipt of said heat exchange conduit inlet section and outlet section, and for receipt of a portion of said elongate rigid tube;

(ii) said side portions including apertures therein constructed and arranged for receipt of said conduit means intake conduit and discharge conduit;

(iii) said body section having internal chambers permitting selective flow of said heat exchange medium therethrough;

(i) wherein when said positioning bar is in said first position said bypass means and manifold means permit flow of said heat exchange medium only through said intake conduit, said manifold internal chambers, and said discharge conduit, and when said positioning bar is in said second position said bypass means and manifold means permits flow of said heat exchange medium through said intake conduit into said heat exchange conduit and through said discharge conduit.

4,964,377

IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

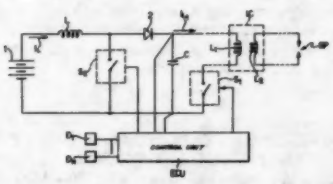
Michele Scarnera, Torino, Italy, assignor to Marelli Autronica S.p.A., Milano, Italy

Filed Nov. 22, 1989, Ser. No. 440,188

Claims priority, application Italy, Nov. 22, 1988, 68040 A/88

Int. Cl.[5] F02P 3/06

U.S. Cl. 123—605 **4 Claims**



1. An ignition system for an internal combustion engine, including a direct-current, low-voltage supply,

at least one spark plug,

an ignition coil with a primary winding for connection to the supply and a secondary winding for connection to the at least one plug,

a first electronic switch between the primary winding of the coil and the supply for controlling the current flow in the primary winding,

sensor means for providing electrical signals indicative of operating conditions of the internal combustion engine, and

an electronic control and operating unit arranged to control the said first electronic switch in a predetermined manner in dependence on the signals provided by the sensor means,

wherein said system also includes

an inductor between said supply and said primary winding of the ignition coil,

a capacitor in parallel with said primary winding and said first electronic switch,

a second electronic switch between said inductor and said supply, which is adapted, in the closed condition, to disconnect the supply from the circuit downstream of the inductor; and

wherein, in order to produce a spark in said at least one plug, said control and operating unit is adapted to pilot said first and said second switches in a mode selected from a first operative mode and a second operative mode in dependence on the signals provided by said sensor means;

in said first operative mode, said control and operating unit effecting

the closure of said second switch and the connection of said inductor to said supply in order to store energy in said inductor, and then

the opening of said second switch and the closure of said first switch in order to connect said inductor to said capacitor so as to form a resonance circuit whose energy is discharged into said primary winding of said coil;

and, in said second operative mode said unit effecting

a plurality of cycles for charging said capacitor, in each of which said second switch is closed in order to store energy in said inductor and then opened in order to transfer the energy to said capacitor so that, in each cycle, the voltage across said capacitor is raised until it reaches a predetermined value, and then

the closure of said first switch and the discharge of said capacitor into said primary winding of the ignition coil.

4,964,378

ENGINE COOLING SYSTEM

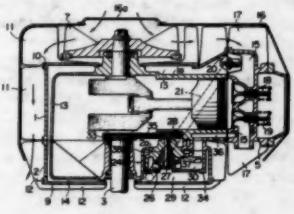
Shinichi Tamba, and Akio Miguchi, both of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Mar. 1, 1989, Ser. No. 317,598

Claims priority, application Japan, Mar. 3, 1988, 63-50933

Int. Cl.[5] F01P 9/04

U.S. Cl. 123—41.57 **19 Claims**



1. A cooling device for an engine including a cylinder head, a crankcase, a crankcase cover and a crankshaft, said device comprising a jacket formed in said crankcase for retaining therein a liquid cooling medium, a plurality of fins provided on said crankcase, a cooling fan arranged at one end of said crankshaft for leading air to said fins and a means for conducting air downwardly over said cylinder head, said crankcase and said crankcase cover comprising an air leading cover arranged to

surround said fan, said cylinder head, said crankcase and at least a portion of said crankcase cover.

4,964,379

TWIN-PISTON TWO-STROKE ENGINE

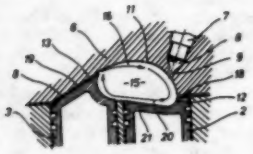
Paul August, C/Ballester 43, Barcelona, Spain

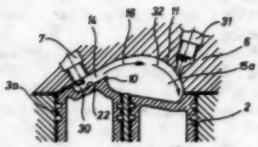
Filed May 5, 1989, Ser. No. 348,248

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1988, 3819196

Int. Cl.[5] F02B *25/08*

U.S. Cl. 123—51 B **20 Claims**





1. A twin-piston two-stroke engine comprising:

a cylinder block,

a first cylinder formed in said cylinder block and provided with an induction port for a combustion mixture,

a second cylinder formed in said cylinder block and provided with an exhaust port for burnt gases,

a partition separating said first and second cylinders, first and second pistons reciprocally movable in said first and second cylinders respectively,

a cylinder head covering said first and second cylinders to define a combustion chamber between the cylinder head and respective upper surfaces of said pistons at top dead center, wherein a squish gap is formed between an upper surface portion of said first piston and a corresponding opposed surface of the cylinder head to force the combustion mixture into the combustion chamber, the part of the cylinder head defining the combustion chamber being of substantially arcuate shape, the second piston having in its upper surface a curvature which from one end constitutes an extension of the arcuate surface of the cylinder head and terminates at its other end in a straight section and

means for igniting said combustion mixture in said combustion chamber,

wherein said cylinder head and said upper ends of said pistons are so shaped as to impart a swirling motion to said combustion mixture.

4,964,380

INDUCTION SYSTEM FOR A TWO-CYCLE ENGINE

David W. Kusche, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed May 24, 1989, Ser. No. 356,782

Int. Cl.[5] F02B *33/04*

U.S. Cl. 123—52 MF **13 Claims**

1. A two-stroke cycle, crankcase compression engine comprising:

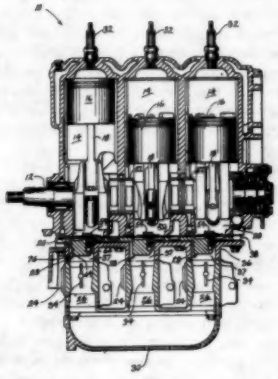
a crankshaft;

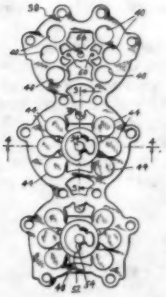
a crankcase surrounding said crankshaft;

an induction passage for supplying air-fuel mixture to said crankcase;

air-fuel mixture supply means for supplying air-fuel mixture to said induction passage; and

reed valve means mounted in said induction passage between said crankcase and said induction passage, said reed valve means including a reed block having a plurality of





ports arranged in oppositely spaced sets, each set comprising a plurality of spaced ports, and a plurality of reed valves, each normally closing one of said ports and opening in response to low pressure within said crankcase to admit air-fuel mixture thereto, wherein said reed valve means comprises a single valve member having a plurality of reed valve petals extending outwardly therefrom comprising said plurality of reed valves, said petals being disposed over said valve ports.

4,964,381

FUEL INJECTION FEATURES OF A TWO-CYCLE ENGINE FOR MOTORCYCLES

Tomoo Shiozaki; Yoshiyuki Kawaguchi; Yasuhiko Nakano; Yusuke Gotoda, and Hiroo Takemura, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1989, Ser. No. 386,559

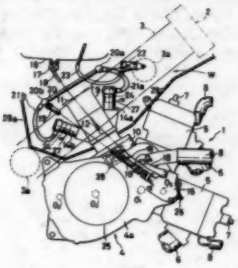
Claims priority, application Japan, Jul. 29, 1988, 63-188300; Aug. 5, 1988, 63-194543

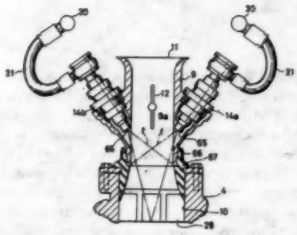
Int. Cl.[5] F02B *33/04*

U.S. Cl. 123—73 A **12 Claims**

1. A two-cycle engine for motorcycles, wherein at least one

fuel injection valve for injecting fuel into an air intake passageway at a predetermined timing is disposed on the upstream side at at least one end transverse to the longitudinal side of a reed valve defining an elongated aperture in the air intake passage-





way communicating with an interior of the engine via said reed valve, with the injection port thereof directed toward said elongated aperture, said reed valve opened by reduced pressure within said engine.

4,964,382

PISTON FOR TWO-CYCLE INTERNAL COMBUSTION ENGINE

Satoru Kikuchi, Fussa, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Sep. 28, 1989, Ser. No. 414,169
Claims priority, application Japan, Oct. 19, 1988, 63-261691
Int. Cl.[5] F02B *33/04*
U.S. Cl. 123—73 AA **4 Claims**

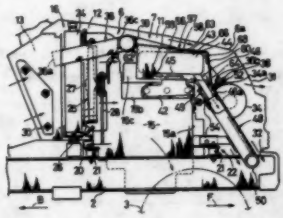
1. A piston reciprocating in a cylinder having a cylinder wall for a two-cycle internal combustion engine, characterized in that a hole is provided in the piston at a position upwardly remote from a lower end of a skirt portion, which position corresponds to a position of an inlet port in the cylinder wall, and said hole has an opening area much smaller than that of said inlet port.

4,964,383

WATER-COOLED TYPE INTERNAL COMBUSTION ENGINE FOR FARMING MOTOR VEHICLE

Yoshio Shinno, and Yasuhiko Nakade, both of Sakaishi, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Jan. 4, 1990, Ser. No. 461,144
Claims priority, application Japan, Jan. 11, 1989, 1-2264[U]
Int. Cl.[5] F02F *7/00*
U.S. Cl. 123—195 C **6 Claims**



1. A water-cooled type internal combustion engine for a farming motor vehicle having an engine room including a first space and a second space arranged side by side in the fore and rear direction of the farming motor vehicle, which internal combustion engine comprising:

an engine body disposed in the fore and rear direction within the first space of the engine room;

a radiator and a radiator fan arranged side by side in the fore and rear direction within the second space, said radiator fan being disposed so that a cooling air can be delivered to the first space after passing through the radiator in the fore and rear directions;

a muffler having a muffler body and an exhaust gas outlet pipe, said muffler body being disposed in the fore and rear direction within the space on a lateral side of the engine body, said outlet pipe being projected from a downwind side portion of the muffler body and having a projected end portion;

an exhaust gas dilution pipe having a first end portion and a second end portion and being externally fitted at its first end portion to the outlet pipe so as to provide a cooling air passage gap therebetween, said second end portion being extended below the projected end portion of the outlet pipe;

a muffler cover covering the muffler body so as to provide a muffler cooling air passage therebetween; and

said muffler cooling air passage comprising an air passage inlet facing said second space, an air passage portion and an air passage outlet facing the cooling air passage gap kept in communication to each other in order.

4,964,384

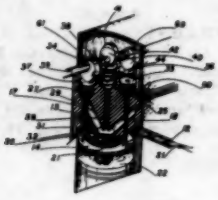
TORNADO ENGINE

Carl M. Getz, 1610 Plunkett St., Hollywood, Fla. 33020

Filed Aug. 31, 1989, Ser. No. 400,949
Int. Cl.[5] F02B *31/00*
U.S. Cl. 123—306 **7 Claims**

1. In an internal combustion engine, a piston operable in a cylinder, cam means, a truncated conical intake passageway to said cylinder, separate intake valve means in said cylinder connecting to said intake passageway, a truncated conical exhaust passageway from said cylinder, and separate exhaust

valve means in said cylinder connecting to said outlet passageway; said exhaust passageway being positioned above said



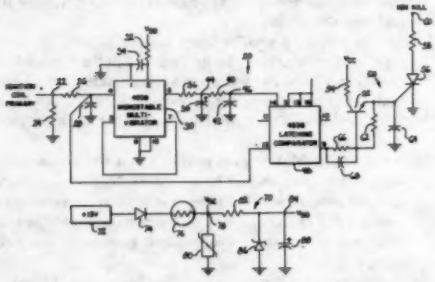
intake passageway, said cam means being operable on said intake valve means and said exhaust valve means.

4,964,385

ENGINE OVERSPEED CONTROL

Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jan. 3, 1990, Ser. No. 460,646
Int. Cl.[5] F02P *11/02*
U.S. Cl. 123—335 17 Claims



1. An overspeed control method for a multicylinder internal combustion engine having an ignition circuit supplying ignition pulses, comprising:

initiating a timing interval in response to the ignition pulse of a given cylinder;

permitting ignition pulses to the remaining cylinders during and after said timing interval, if engine speed is below a given threshold;

permitting ignition pulses to the remaining cylinders during said timing interval and cutting out ignition pulses to the remaining cylinders after said timing interval until the next occurrence of the ignition pulse for said given cylinder, if engine speed is at said threshold;

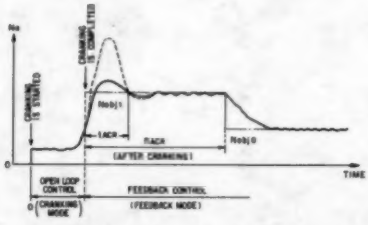
cutting out at least some of the remaining ignition pulses during said timing interval and also cutting out the remaining ignition pulses after said timing interval until the next occurrence of the ignition pulse for said given cylinder, if engine speed is above said threshold.

4,964,386

IDLING ROTATIONAL SPEED CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES AFTER CRANKING

Eitetsu Akiyama, and Katsuhiko Suzuki, both of Wako, Japan, assignors to Honda Motor Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1989, Ser. No. 419,607
Claims priority, application Japan, Oct. 12, 1988, 63-256468
Int. Cl.[5] F02D *41/08*
U.S. Cl. 123—339 8 Claims



1. In a system for controlling an idling rotational speed of an internal combustion engine having an intake air passage, and a throttle valve provided in said intake air passage,

said system including a bypass air passage bypassing said throttle valve, a control valve for adjusting opening area of said bypass air passage, valve driving means for driving said control valve, and control means for supplying a control signal to said valve driving means,

said control means including engine rotational speed detecting means for detecting a rotational speed of said engine, after-start determining means for determining whether or not a first predetermined time period has elapsed after completion of cranking of said engine, desired engine rotational speed setting means for setting a desired idling rotational speed of said engine, difference determining means for determining a difference between the engine rotational speed detected by said engine rotational speed detecting means and the desired idling engine rotational speed set by said desired engine rotational speed setting means, engine rotational speed variation detecting means for detecting a variation in the detected engine rotational speed, control amount determining means for determining a value of the control signal by the use of at least one control term based on the determined difference and a differential term based on the detected engine rotational speed variation, control gain determining means for determining control gains of said at least one control term and said differential term in response to the result of determination by said after-start determining means,

the improvement comprising differential term changing means for setting and holding the differential term at zero before a second predetermined time period elapses after completion of cranking of said engine when said after-start determining means has detected that the first predetermined time period has not elapsed yet after completion of cranking of said engine.

4,964,387

DETONATION CONTROL SYSTEM FOR A MARINE ENGINE

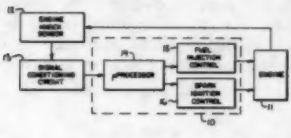
Steven K. Hansen, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sep. 11, 1989, Ser. No. 405,687
Int. Cl.[5] F02D *41/04*; F02P *5/15*
U.S. Cl. 123—425 6 Claims

1. A detonation control system for a fuel injected, spark ignition two-cycle engine comprising:

sensor means for sensing engine knock and for providing a

linear series of engine knock signals which are directly proportional to the magnitude of the knock sensed; and,



detonation control means responsive to said knock signals for providing a non-linear series of stepped increases in the fuel injection pulse width to the engine corresponding to said series of knock signals.

4,964,388

METHOD AND DEVICE FOR REGULATING A CONTROLLED IGNITION ENGINE FROM THE STATISTIC DISTRIBUTION OF AN ANGULAR DIVERGENCE

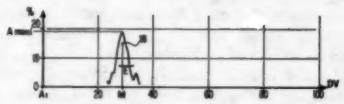
Claude Lefebvre, Sartrouville, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

Filed Jun. 28, 1988, Ser. No. 212,691

Claims priority, application France, Jun. 30, 1987, 87 09264

Int. Cl.[5] F02D *41/14*

U.S. Cl. 123—435 **6 Claims**



1. A method for adjusting at least one parameter at least partially conditioning an operation of an internal combustion engine with controlled ignition, the method comprising the steps of:

detecting a passage of a flame front in at least one cylinder of the internal combustion engine;

examining an angular divergence existing between an angular reference position and an angular position at which detection of the passage of the flame front occurs, said angular reference position corresponding to a moment of energization of a spark plug of the internal combustion engine;

determining a control magnitude from a distribution based on several angular divergences corresponding to a predetermining number of cycles of the internal combustion engine for controlling an operation of the internal combustion engine; and

modifying the at least one parameter so that the control magnitude assumes a predetermined value, and wherein said control magnitude is determined in accordance with at least one of the following values;

a mean value of said angular divergence;

a typical divergence or variance of said mean value;

a maximum value of the distribution of the angular divergences;

a value of the distribution of angular divergences for a given crankshaft angle;

an angular spread of the distribution of the angular divergences; or

a value of an angle beyond which a fixed number of detections of the flame front is noted.

4,964,389

FUEL INJECTION DEVICE FOR INTERNAL COMBUSTION ENGINES

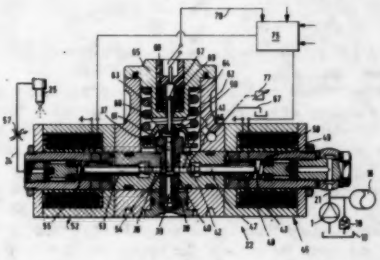
Konrad Eckert, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 20, 1989, Ser. No. 424,643

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1988, 3843467

Int. Cl.[5] F02M *39/00*

U.S. Cl. 123—447 **22 Claims**



1. A fuel injection device for an internal combustion engine having a fuel supply tank, a fuel feed pump (1) that pumps fuel from said fuel supply tank to a high-pressure reservoir (16) said high reservoir communicates with a reservoir chamber (38) via a first electrically controlled valve (45) which is electrically controlled by a control unit (75), for pre-storing a fuel injection quantity in said reservoir chamber (38), said reservoir chamber as defined by a movable wall (37) that is adjustable counter to a restoring force (63), and, via a second electrically controlled valve (52) electrically controlled by said control unit (75), said reservoir chamber (38) can be made to communicate with a fuel injection valve (25) via a connecting line (24), under the influence of the restoring force and with said first electrically controlled valve (45) closed, said reservoir chamber (38) can be evacuated toward the fuel injection valve (25), also associated with the adjustable wall (37) is a travel transducer (68) which generates a signal corresponding to the deflection travel of the adjustable wall (37) counter to the restoring force, which signal is connected to the control device (75), said control device (75) includes a comparison device for comparing the signal of the travel transducer with a set-point value formed as a function of operating parameters, and when the set-point value is attained the first electrically controlled valve (45) is closed once again whereby the filling of the reservoir chamber (38) in intervals is controlled by the triggering of the first electrically controlled valve (45).

4,964,390

FUEL SUPPLY CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

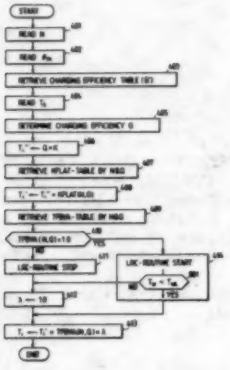
Katsunobu Kametz; Kiyomi Morita; Takeshi Kikuchi, and Yoshiyuki Tanabe, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Ibaraki, both of, Japan

Filed Apr. 21, 1989, Ser. No. 341,763

Claims priority, application Japan, Apr. 26, 1988, 63-101228

Int. Cl.[5] F02M *51/00*

U.S. Cl. 123—489 **13 Claims**



1. A fuel supply control apparatus for an internal combustion engine, comprising:

an operational condition sensor for detecting an operational condition of the engine, including at least a rotational speed of the engine and a load thereof;

an oxygen sensor for detecting an air/fuel (A/F) ratio of a fuel mixture supplied to the engine; and

a control unit, including a microprocessor, which is programmed to execute the following steps:

calculating a preliminary amount of fuel to be supplied to the engine on the basis of the operational condition of the engine;

retrieving (1) an A/F ratio correction coefficient from a correction map provided din a memory of the microprocessor in accordance with an operational condition of the engine, the map having plural storage areas, each capable of being designated by a value of at least one operational condition of the engine, for storing A/F ratio correction coefficient, and (2) an A/F ratio deviation coefficient from an additional storage provided in said memory;

determining a correction value by combining said A/F ratio correction coefficient and said A/F ratio deviation coefficient obtained in said retrieving step;

determining a final amount of fuel to be supplied to the engine by correcting the preliminary fuel supply amount on the basis of the correction value; and

renewing the correction value used for the determination of a final fuel supply amount on the basis of the a/F ratio detected by said oxygen sensor, when the engine is in an operation state in which A/F ratio feed-back control is possible;

said microprocessor executing the following steps in order to renew said correction value:

obtaining a difference between an A/F ratio detected by said oxygen sensor and a reference A/F ratio set for a/F ratio feed-back control;

dividing said difference into two components to form an A/F ratio correction coefficient and an A/F ratio deviation coefficient, in accordance with a predetermined ratio, wherein a summation of said two components forms said correction value; and

storing the A/F ratio correction coefficient in an area of the correction map corresponding to the operational condition of the engine and the accumulating the A/F ratio deviation coefficient in the additional storage without regard to an operational condition of the engine.

4,964,391

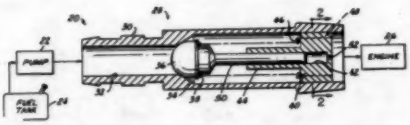
CHECK VALVE FOR ENGINE FUEL DELIVERY SYSTEMS

Thomas M. Hoover, Reese, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed May 30, 1989, Ser. No. 358,860

Int. Cl.[5] F02M *39/00*

U.S. Cl. 123—510 **8 Claims**



1. A fuel delivery system for an internal combustion engine or the like that includes a fuel supply, a fuel pump for delivering fuel under pressure from the supply to the engine, and a check valve between the pump and the engine for preventing back-flow of fuel from the engine to the pump,

said check valve comprising a valve element, means defining a flow passage surrounding said element including a valve seat opposed to said element, spring means for urging said element against said seat, motion of said valve element off of said seat against said spring means being a function of fuel pressure from said pump, guide means positioned in said passage on a side of said valve element remote from said seat and having a central bore coaxial with said passage, means extending from said valve element slidably disposed in said bore for guiding motion of said valve element axially of said passage and restraining motion of said valve element laterally of said passage, and a fluid orifice connecting said bore with said passage coaxially with said bore and passage at an end of said bore remote from said valve element, said bore, said means slidably disposed in said bore and said fluid orifice cooperating to form a fluid piston/cylinder construction for damping axial motion of said valve element in said passage, said orifice being of a diameter to dampen motion of said valve element over a preselected frequency range.

4,964,392

BAKING OVEN

Adrian A. Bruno; Thomas Diwisch; Ralph Chrzastek, and Richard Casanzio, all of Morton Grove, Ill., assignors to Middleby Marshall Inc., Morton Grove, Ill.

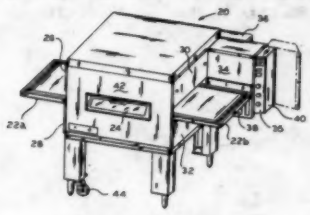
Continuation-in-part of Ser. No. 215,042, Jul. 5, 1988, abandoned. This application Dec. 15, 1988, Ser. No. 285,287

Int. Cl.[5] A21B *1/00;* **F24C** *15/32*

U.S. Cl. 126—21 A **23 Claims**

1. A baking oven comprising an oven, a substantially flat conveyor extending into one side through said oven and out the other side of said oven for continuously carrying baking objects from said one side through said oven and out the other side of said oven, a pair of access panels attached to at least one end of said oven and above and below said conveyor leaving only enough room for said baking object to be carried through said oven, whereby said oven access panels may be removed to provide complete access to said oven at the end of said con-

veyor, and an access window hinged on one side to a front of said oven for giving access at a side of said conveyor within said oven, said access window resting solely under gravity in either an open or a closed position.



4,964,393

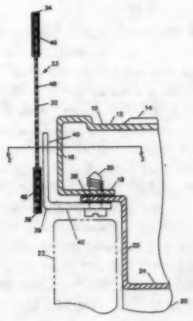
PROTECTIVE SHIELD FOR STOVE

Michael J. Knudsen, 32918 Illinois, Livonia, Mich. 48150

Filed Mar. 16, 1990, Ser. No. 494,311

Int. Cl.[5] F24C *15/10*

U.S. Cl. 126—211 **7 Claims**



1. In a cooking stove comprising a top wall; a plural number of burners on said top wall; a front wall extending downwardly from said top wall, said front wall having a rearwardly extending flange thereon; an oven within the stove below said top wall; said oven comprising a roof wall, and a front wall extending upwardly from said roof wall; said oven front wall having a forwardly extending flange thereon extending along said rearwardly extending flange so that said flanges overlap one another; said flanges having at least two sets of aligned holes spaced therealong: the improvement comprising a protective shield adapted to assume an upright position in front of the front wall, to thereby prevent small children from reaching the stove burners or cooking containers on the burners; said protective shield comprising an upstanding panel spanning substantially the entire width dimension of the stove in front of the stove front wall; said panel having a lower edge in approximate horizontal alignment with said overlapped flanges, said panel having an upper edge located at least two inches above the plane of the stove top wall, such that small children are precluded from direct hand access to the burners or items located on the stove top wall; and a panel-mounting means comprising a horizontal plate means extending horizontally from the panel at its lower edge; said horizontal plate means having slots therethrough extending parallel to the plane of the upstanding panel; said slots having a similar spacing to the spacing of the aligned sets of holes, whereby said slots are enabled to overlap respective ones of the holes; and screw fasteners extending through the horizontal plate means and the aligned holes to rigidly affix the shield to the stove.

4,964,394

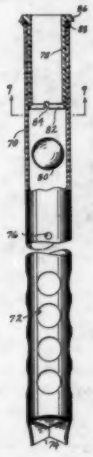
WATER HEATER WITH HEAT TRAP IN DIP TUBE

Gary S. Threatt, Kershaw, S.C., assignor to A.O. Smith Corporation, Milwaukee, Wis.

Filed May 9, 1989, Ser. No. 348,975

Int. Cl.[5] F24H *1/00*

U.S. Cl. 126—361 **12 Claims**



1. A water heater comprising a storage tank holding water to be heated, an opening in said tank, a dip tube extending downwardly into said tank from said opening for introducing water into said tank, an upper valve seat in said dip tube, a lower stop in said dip tube, a sealing member in said dip tube and movable longitudinally upwardly and downwardly therein between said upper valve seat and said lower stop, said sealing member having a density less than water such that said sealing member floats in water upwardly into engagement with said valve seat to close same and prevent heat lose upwardly through and out of said dip tube and to prevent convection water currents upwardly through and out of said dip tube, said sealing member moving downwardly out of engagement with said valve seat in response to incoming water flowing through said valve seat and downwardly in said dip tube, an external spud attached to said tank at said opening, and an inlet water pipe threaded directly into said spud without an extra fitting for a heat trap, the heat trap function being performed in said dip tube and eliminating the cost of a separate external heat trap fitting otherwise required for such function.

4,964,395

APPARATUS AND METHOD FOR A SOLAR RADIATION WATER HEATER

Angel M. Salgado, 6060 W. Royal Palm Rd., Glendale, Ariz. 85302, and Harold L. Drury, 3852 W. Dalphin Rd., Phoenix, Ariz. 85021

Continuation-in-part of Ser. No. 932,938, Nov. 20, 1986, Pat. No. 4,782,816. This application Nov. 7, 1988, Ser. No. 268,004

Int. Cl.[5] F24J *2/04*

U.S. Cl. 126—437 **16 Claims**

1. A solar radiation water heater comprising:

a plurality of generally triangularly shaped solar panels, each solar panel including:

a transparent outer panel for transmitting radiation incident thereon;

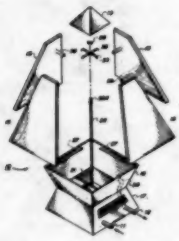
a inner panel generally parallel to said outer panel, said

inner and said outer panel forming sides of an enclosed region;

channel structure associated with said first and second panels for controlling flow in said enclosed region;

radiation absorbing means for absorbing radiation transmitted through said outer panel, said radiation absorbing means having surfaces thereof exposed to said enclosed region;

an inlet aperture permitting water to be introduced into said enclosed region;



an outlet aperture permitting water to flow from said enclosed region, said water flowing through said enclosed region coming in contact with said radiation absorbing means;

assembly means for securing said said solar panels in a generally pyramidal structure; and

a pedestal structure, wherein said assembly means secures each solar panel with respect to said pedestal structure and with respect to other solar panels.

4,964,396

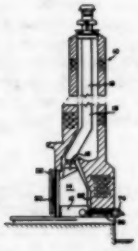
FIREPLACE RESTORATION UNIT

Bruce P. Crum, 37 W. Glen Rd., Denville, N.J. 07834

Filed Feb. 7, 1990, Ser. No. 476,312

Int. Cl.[5] F24B *1/183*

U.S. Cl. 126—508 **29 Claims**



1. A fireplace restoration unit, comprising:

a fireplace body, for fully recessed emplacement within an existing masonry fireplace, having an open bottom for setting directly upon, and effecting an open communication with, a fireplace hearth; and

a flexible flue lining, (a) for coupling thereof to said body, and (b) for insertion thereof into the flue of such an existing masonry fireplace.

4,964,397

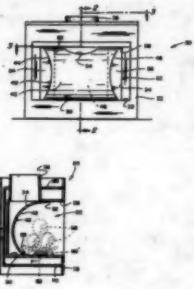
FIREPLACE CONSTRUCTION

David S. Purcell, 971 N. Clay, Kirkwood, Mo. 63122, and Kelley J. Wells, 6424 Stillhouse La., Highridge, Mo. 63049

Filed Sep. 15, 1989, Ser. No. 408,116

Int. Cl.[5] F24B *1/195*

U.S. Cl. 126—552 **27 Claims**



1. A fireplace unit for installing in a fireplace opening including an open sided fireproof enclosure formed by connected opposed side walls, a top wall, a bottom wall, a rear wall and connection means to an exhaust flue in said top wall, the improvement comprising an intermediate wall member of overall curved configuration mounted in said fireplace opening, said intermediate wall member being located in spaced apart relationship in front of the rear wall of said fireproof enclosure and extending in abutting relationship between the opposed side walls and between the top and bottom walls of said fireproof enclosure thereby defining a substantially enclosed spaced in the fireplace opening behind said intermediate wall member, and means associated with the top wall of said enclosure and said intermediate wall member for communicating the space in front of said intermediate wall member to the exhaust flue.

4,964,398

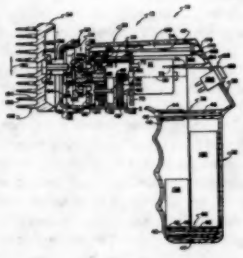
SHAMPOO OR MASSAGE DEVICE

Letha L. Jones, 830 W. Princess Dr., Corpus Christi, Tex. 78410

Filed Apr. 18, 1988, Ser. No. 182,390

Int. Cl.[5] A61H *7/00*

U.S. Cl. 128—51 **8 Claims**



1. A shampoo or massage device comprising

a housing having a pistol grip handle providing a first cavity

and a generally cylindrical section perpendicular to the pistol grip section including first and second spaced partition walls providing second, third and fourth cavities aligned along a housing axis;

rechargeable battery means in the first cavity and electrical conductor means communicating through the pistol grip section for recharging the battery means when the pistol grip section is placed in a battery charger;

a dc motor, in the second cavity, mounted on the first partition wall and including an output shaft extending through the first partition wall;

circuit means including a switch connecting the motor to the battery means;

a gear reduction unit, in the third cavity, having

a rotary input member operatively connected to the motor output shaft, and

a gear reduction output member;

a rotary to reciprocating conversion unit in the fourth cavity comprising

a rotary input member extending across the second partition wall and operatively connected to the gear reduction output member and

a reciprocating output member traversing a path of movement across the housing axis; and

means sealing between the third and fourth cavities including means providing a seal between the second partition wall and the rotary input member; and

a body engaging assembly mounted on the reciprocating output member having a plurality of body engaging members generally parallel to the housing axis.

4,964,395

AUTOMATIC CURATIVE HYDROMASSAGE APPARATUS

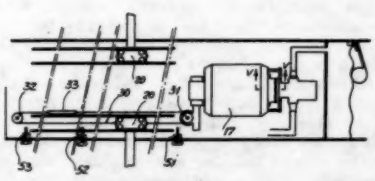
Maria Faimali, Via Camia, 24 -- 29100 Bettola di Piacenza, Piacenza, Italy

Filed Oct. 19, 1988, Ser. No. 260,007

Claims priority, application Italy, Oct. 21, 1987, 22366 A/87

Int. Cl.[5] A61H *9/00*

U.S. Cl. 128—66 **2 Claims**



1. An apparatus for massages comprising a vertical fixed structure to be arranged in a corner zone of a shower room, a water tank supported by said fixed structure including a float member to control a water supply to a water supply duct, a pump communicating with said tank and water supplying said water supply duct, a carriage slidingly supported by said vertical fixed structure to vertically reciprocate thereon, a rope coupled to said carriage, a driving wheel and an idle wheel, said rope being entrained on said driving wheel and idle wheel, a motor coupled to said driving wheel to drive said driving wheel so as to cause said carriage to vertically reciprocate as controlled by said rope, limit switches for controlling said carriage, said carriage supporting a water spraying nozzle duct communicating with said water supply duct through a loading valve, wherein said water spraying nozzle duct includes a plurality space water spraying nozzles arranged in a closed loop pattern oriented toward the center of said closed loop pattern for encompassing a person to be hydromassaged.

4,964,400

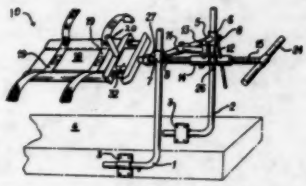
SURGICAL LIMB SUPPORTING APPARATUS WITH TENSION MEASURING DEVICE

Joseph P. Laico, New City, and Joseph L. Molino, Valley Cottage, both of N.Y., assignors to Lincoln Mills, Inc., New City, N.Y.

Continuation-in-part of Ser. No. 183,636, Apr. 19, 1988, abandoned. This application Mar. 3, 1989, Ser. No. 318,811

Int. Cl.[5] A61G *13/00*

U.S. Cl. 128—75 **6 Claims**



1. A limb supporting apparatus adaptable for use during surgery and mountable to a standard operating table having an end portion with opposed sides comprising:

a pair of support bars each having end portions;

clamp means for mounting said support bars to opposed sides of the operating table so that said end portions of said support bars extend generally vertically upward above the table;

connecting bar means secured between said end portions;

limb supporting means secured to said connecting bar means comprising:

a pair of inner tines attached to an inner base means for interconnecting said inner tines;

a pair of outer tines mounted in telescopic relationship to said inner tines and attached to an outer base means for interconnecting said outer tines;

limb support mounting means connecting said inner base means for mounting said limb supporting means to said connecting bar means; and

tension indicating means engagable with said inner and outer base means for directly indicating the tension between said inner and outer base means.

4,964,401

WEIGHTLIFTING BELT

Roger L. Taigen, 3609 Ranch Rd. East, Altus, Okla. 73521

Filed Sep. 29, 1989, Ser. No. 414,467

Int. Cl.[5] A61F *5/02, 5/37*; A63B *21/072, 21/00*

U.S. Cl. 128—78 **10 Claims**

1. A weightlifting belt comprising:

an elongated belt body having a pair of opposed ends;

an elongated backup strap secured over its entire length to one side of the belt body and having a pair of opposed ends spaced inwardly along the length of the elongated belt body from the ends of the belt body;

first fastening means secured to said belt body adjacent one of the ends thereof and to the side of said belt body to which said backup strap is secured;

second fastening means secured to said belt body adjacent the other of the ends thereof opposite said one end and one the opposite side thereof from said first fastening means in a position to contact and engage said first fastening means when the ends of said belt body are overlapped, and the weightlifting belt encircles the waist of the wearer;

a buckle secured to said backup strap adjacent one of the ends thereof, and fixed in its position relative to said belt body;

an elongated holding strap having a first end secured to said belt body and having a second end spaced from said belt body and dimensioned to pass through said buckle when said weightlifting belt is secured in operative position around the waist of the user;

third fastening means secured to said holding strap adjacent the second end thereof, and adapted to pass with said second end of said holding strap through said buckle; and

fourth fastening means connected to said belt body at a location spaced along said backup strap from said one of the ends thereof at which said buckle is located.

4,964,402

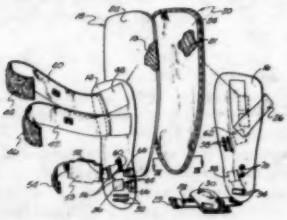
ORTHOPEDIC DEVICE HAVING GEL PAD WITH PHASE CHANGE MATERIAL

Tracy E. Grim, Broken Arrow, Okla., and Jeffrey R. Haines, Encino, Calif., assignors to Royce Medical Company, Culver City, Calif.

Filed Aug. 17, 1988, Ser. No. 233,273

Int. Cl.[5] A61F *5/00*

U.S. Cl. 128—80 H **16 Claims**



1. An orthopedic device for supporting an injured body member and providing temperature therapy to the member comprising:

means for providing support to said injured body member;

gel pad means adapted to be mounted between said supporting means and said injured body member for cooperating with said supporting means to provide resilient support and cushioning effect between said injured body member and said supporting means and for selectively providing temperature therapy to said injured body member, said gel paid means including gel material having at least one phase change material contained therein, said phase change material providing increased thermal storage capacity to said gel material, said gel pad means capable of being removed from between said supporting means and said injured body member so that the temperature of said gel pad means may be changed, and then placed between said injured body member and said supporting means in order to provide temperature therapy for said injured body member due to said increased thermal storage capacity provided by said phase change material, said gel material remaining pliable during said temperature therapy in order to facilitate said resilient support and said cushioning effect of said gel pad means, said phase change material being encapsulated in a sheet of capsules inside said gel pad means, said sheet of capsules preventing said phase change material from moving inside said gel pad means in order to provide a more uniform temperature distribution across said gel pad means; and

means for removably securing said supporting means to said injured body member.

4,964,403

STABILIZER FOR THE TREATMENT OF THE FRACTURE OF THE NECK AND UPPER METAPHYSIS OF THE FEMUR

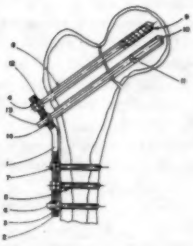
Wlodzimierz Karás, Dabrowa Górnicza; Robert Granowski; Witold Ramotowski, both of Warsaw; Aleksander Tuziemski, Sosnowiec; Jerzy Cieplak, Dabrowa Górnicza, and Kazimierz Pilawski, Warsaw, all of Poland, assignors to Huta Baildon Przedsiebiorstwo Panstwowe Katowice, Zelazna, Poland

Filed Dec. 15, 1987, Ser. No. 132,937

Claims priority, application Poland, Dec. 19, 1986, 263194; Dec. 19, 1986, 78990

Int. Cl.[5] A61F *5/04*; A61B *17/18*

U.S. Cl. 606—60 **3 Claims**



1. A stabilizer for the treatment of fractures of a femur neck and the proximate upper metaphysis of the femur, comprising: an elongated bent plate having a planar base and an upper angularly disposed arm, the plate being adapted to be mounted by means of bone screws and fasteners adjacent the neck and proximate upper portion of a fractured femur, characterized in that the plate is provided with a first set of holes having on the side of the plate away from the bone a frusto-conical tapered shape, while on the side of the plate facing the bone an oval shape, and a second set of holes in the upper angular arm portion of the plate having on the side facing away from the bone a frusto-conical tapered shape and on the side adjacent the bone a circular shape, there being an elongated groove along the entire length of the plate on the side to face toward the bone, a first set of bone bolts adapted to be secured in the base of the femur in the upper proximate region near the fracture, said bolts having cortex-type high pitch threads for securing the same within the porous structure of the bone itself, there being a second set of elongated bolts adapted to be secured in the neck portion of the femur, said second set of bolts having cortex-type high pitch threaded portion at the leading ends thereof, and having an intermediate cylindrical unthreaded core adapted to pass through corresponding cylindrical holes pre-drilled in the neck portion of the femur and having at the remote outer ends, threaded shank portions adapted to be secured by means of fastener nuts to said plate arm, said second set of bolts having at least one cutting-edge extending around the lead end of said cortex thread part, to enable securing said bolts into the femur neck without pretapping holes in any bone fragments, both of said sets of bolts having second threaded shank portions at the remote head ends thereof in the form of a standard machine threads adapted to protrude outwardly through the sets of plate holes, said bolts further being provided with a disc in the form of an enlarged shoulder between the intermediate core and threaded outer shank, adapted to fit within said elongated groove in the plate upon assembly therewith, the remote threaded shank

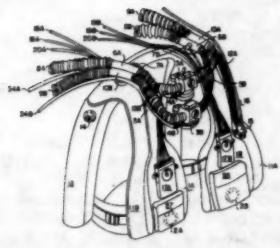
ends of said bolts extending through said sets of holes to be secured to the plate by means of corresponding sets of fastener nuts having internal threaded portions to match the threads on said protruding bolt shanks, and frusto-conical tapered base parts corresponding to the tapered holes in said plate, whereupon selective tightening of said fastener nuts over said stabilizer plate will enable deformation of said plate to apply appropriate tension forces to said elongated bone bolts without exertion of any adverse pressure by the plate against the bone.

4,964,404

BREATHING APPARATUS

William C. Stone, 7739 Laytonia Dr., Derwood, Md. 20855

Filed Apr. 19, 1989, Ser. No. 340,251
Int. Cl.[5] A61M *16/00*; A62B *9/02*
U.S. Cl. 128—204.22 42 Claims



1. A breathing apparatus comprising:
a first circuit comprising:
a mouthpiece;
a counterlung;
a carbon dioxide removal device;
said first circuit being operatively connected to enable gas to flow from said mouthpiece to said counterlung and said carbon dioxide removal device and back to said mouthpiece; and further comprising:
a second circuit comprising:
a supply of breathable gas normally automatically supplied to said first circuit over a first path;
a manual override system for manually interrupting said automatically supplied breathing gas; and
a second path for selectively manually connecting said supply of breathable gas to said first circuit through said manual override system for selectively manually admitting breathable gas into said first circuit.

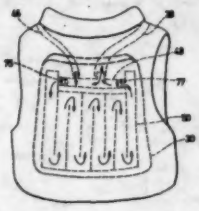
4,964,405

EMERGENCY RESPIRATION APPARATUS

Frank W. Arnoth, Glen Mills, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 1, 1989, Ser. No. 402,097
Int. Cl.[5] A62B *7/00*
U.S. Cl. 128—205.17 14 Claims

1. In a portable closed circuit breathing apparatus of the type comprising a pressurized source of breathable gas, a CO_2 absorption means, means for releasing the breathable gas to at least one breathing cavity of a user, and means for circulating the breathable gas between the user and the CO_2 absorption means, the improvement wherein the means for circulating the breathable gas comprises a breathing bag in operative connection with the source of breathable gas and having a plurality of collapsible channels and unidirectional flow directing means to control flow through the channels; and wherein the CO_2 absorption means is disposed within the channels of the breathing bag.

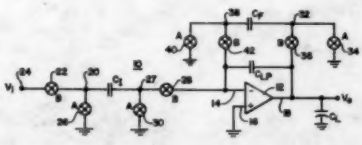


4,964,406

IMPLANTABLE CARDIAC DEFIBRILLATOR EMPLOYING A SWITCHED CAPACITOR STAGE HAVING A NON-50/50 DUTY CYCLE

Kenneth J. Carroll, San Jose, and Benjamin D. Pless, Menlo Park, both of Calif., assignors to Ventritex, Inc., Sunnyvale, Calif.

Filed May 19, 1989, Ser. No. 354,467
Int. Cl.[5] A61N *1/39*
U.S. Cl. 128—419 D 8 Claims



1. An implantable medical device comprising:
electrode means adapted for coupling to a patient's heart;
sensing means having inputs connected to said electrode means for sensing cardiac electrical signals;
said sensing means including switched capacitor means having switches clocked by first and second control signals with a non-50/50 percent duty cycle;
said switched capacitor means comprising operational amplifier means having an inverting input terminal, a non-inverting input terminal and an output terminal;
said operational amplifier means having greater than 50 percent of the clock period to acquire a desired voltage on the output terminal and less than 50 percent of the clock period to hold the acquired voltage.

4,964,407

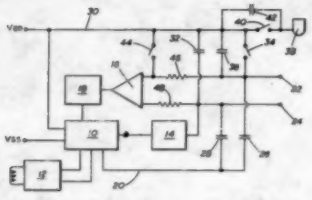
METHOD AND APPARATUS FOR ASSURING PACER PROGRAMMING IS COMPATIBLE WITH THE LEAD

Ross G. Baker, Jr., Houston, and Joseph W. Vandegriff, Freeport, both of Tex., assignors to Intermedics, Inc., Angleton, Tex.

Filed Aug. 29, 1988, Ser. No. 237,719
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—419 PG 27 Claims

1. A circuit for recognizing a functional bipolar lead attached to an implantable cardiac pacemaker capable of bipolar and unipolar operation, the pacemaker comprising a pulse generator, an indifferent electrode, an anode lead connector and a cathode lead connector, the circuit comprising:
means for generating a test signal;
impedance means connecting said signal generating means and said anode lead connector;
means for providing a low impedance path connecting the

anode lead connector to the ground potential through said functional bipolar lead if said functional bipolar lead is connected to said cardiac pacemaker, the path passing through a portion of a patient's body;



means for sensing a level of the test signal at the anode lead connector; and

means for disabling bipolar pacing of the pacemaker if the test signal at the anode lead connector exceeds a predetermined value.

4,964,408

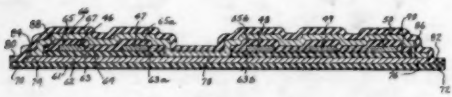
OXIMETER SENSOR ASSEMBLY WITH INTEGRAL CABLE

Karl M. Hink, Brookfield, and Mark H. Polczynski, Elm Grove, both of Wis., assignors to Thor Technology Corporation, Milwaukee, Wis.

Filed Apr. 29, 1988, Ser. No. 188,217

Int. Cl.[5] A61B 6/00

U.S. Cl. 128—633 **4 Claims**



1. An oximeter sensor assembly with integral cable comprising:

a first layer comprising a thin elongated flexible sheet-like electrically insulating strip;

a second layer on said first layer and comprising a thin elongated flexible sheet-like electrically conductive strip;

a third layer on said second layer and comprising a thin elongated flexible sheet-like electrically insulating strip;

a fourth layer on said third layer and comprising a plurality of electrical conductors;

a fifth layer on said fourth layer and comprising thin elongated flexible sheet-like electrically insulating strip;

a sixth layer on said fifth layer and comprising thin elongated flexible sheet-like electrically conductive strip;

a seventh layer on said sixth layer and comprising thin elongated flexible sheet-like electrically insulating strip;

said third layer having a flexible end portion for flexibly wrapping at least partially around a human body part;

a light emitting electrical component and a light receiving electrical component mounted on said third layer at said end portion and electrically connected to respective said conductors, said light emitting electrical component emitting light capable of passing through a human body part, said light receiving electrical component receiving said light, wherein:

said first and seventh layers have lateral widths greater than said second and sixth layers and extend laterally beyond said second and sixth layers;

said first and seventh layers engage each other along their laterally outward edges;

said second and sixth layers have lateral widths greater than said third and fifth layers and extend laterally beyond said third and fifth layers;

said second and sixth layers engage each other along their laterally outward edges and provide electromagnetic interference shielding of said conductors;

said third and fifth layers extend laterally beyond the lateral extent of said conductors;

said third and fifth layers engage each other along their laterally outward edges;

said third and fifth layers have an aligned gap therein having lateral right and left sides and separating one or more said conductors on the lateral right side of said gap, and one or more said conductors on the lateral left side of said gap, and wherein said second and sixth layers engage each other in electrical contact in said gap in addition to engagement of said second and sixth layers along their laterally outward edges, such that the electromagnetic interference shield provided by said second and sixth layers extends around all said conductors and also has a portion extending around and shielding said conductors on said lateral right side of said gap and also has another portion extending around and shielding said conductors on said lateral left side of said gap.

4,964,409

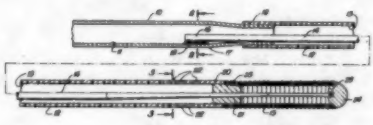
FLEXIBLE HOLLOW GUIDING MEMBER WITH MEANS FOR FLUID COMMUNICATION THERETHROUGH

William S. Tremulis, Redwood City, Calif., assignor to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 350,500, May 11, 1989, Pat. No.

Int. Cl.[5] A61B 5/00

U.S. Cl. 128—657 **22 Claims**



1. A guiding member for advancement within a patient's vascular system, comprising:

(a) a main tubular member which has proximal and distal ends and which has an inner lumen extending therethrough to an opening in the distal end thereof;

(b) a tubular extension more flexible than the main tubular member which has an inner lumen and which is secured by the proximal end thereof to the distal end of the main tubular member;

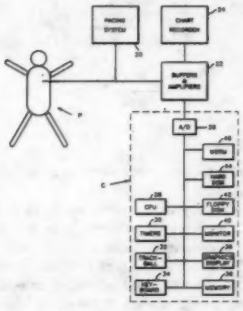
(c) an elongated core member which has a proximal end secured within the inner lumen of the main tubular member at a location proximal to the distal end of the main tubular member and a substantial distance distal to the proximal end thereof and which extends out the opening in the distal end thereof, through the inner lumen of the tubular extension and out the distal end of the tubular extension, the portion of the core member disposed within the inner lumen of the main tubular member having a transverse cross-sectional area substantially less than the transverse cross-sectional area of the inner lumen of the main tubular member; and

(d) a flexible body which is disposed about and secured to a portion of the core member extending out the distal end of the tubular extension and which has a distal tip positioned at least 15 cm distally from where the proximal end of the tubular extension is secured to the main tubular member.

4,964,410
TIME PERIOD AND HEART RATE MEASUREMENT SYSTEM

Edward Leahey, Kemah; Alexander J. Zinner, III, Deer Park, and Christopher A. Howard, Houston, all of Tex., assignors to Coherent Systems, Inc., Houston, Tex.

Filed Nov. 15, 1988, Ser. No. 271,572
Int. Cl.[5] A61B 5/02
U.S. Cl. 128—696 **8 Claims**



1. A system for measuring time intervals between two locations of an electrical analog signal sampled at a given time interval and converted to digital form, comprising:

means for displaying a portion of the sampled signal in a display window;

means for displaying a reference bar in said sampled signal display window at a location and associating a time of a displayed sampled signal with said location;

means for displaying a measurement bar in said sampled signal display window at a location and associating a time of a displayed sampled signal with said location;

means for a user to indicate desired movement of said measurement bar or said reference bar along said displayed sampled signal;

means for displaying the time interval between said reference bar and said measurement bar; and

means for moving said measurement bar in response to said desired movement indication means.

4,964,411
EVOKED EMG SIGNAL PROCESSING

Michael T. Johnson, and Alexander Kipnis, both of Minneapolis, Minn., assignors to Empi, Inc., St. Paul, Minn.

Filed Jul. 13, 1989, Ser. No. 379,415
Int. Cl.[5] A61B 5/04
U.S. Cl. 128—733 **21 Claims**

1. A method of separating dispersive and synchronous time varying myoelectric signals, comprising:

repeatedly evoking the production of myoelectric signals in a muscle with triggering events;

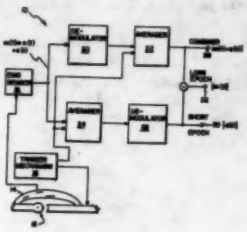
storing myoelectric signal data representative of the produced myoelectric signals as temporal functions of the triggering events;

averaging the myoelectric signal data before any demodulation of the data to produce short latency signal data representative of the short latency components of the myoelectric signals;

demodulating the short latency signal data to obtain demodulated short latency signal data;

demodulating the myoelectric signal data before averaging;

averaging the demodulated myoelectric signal data to obtain combined data representative of short and long latency myoelectric signals; and



combining the combined data with the demodulated short latency signal data to isolate long latency signal data representative of long latency components of the myoelectric signals.

4,964,412
DIAGNOSTIC METHOD FOR DERMATURE TESTING

Kevin G. Kelly, 152 Mannamead Road, Hartley, Plymouth Devon Pl3 5QL, United Kingdom

Filed Jul. 18, 1988, Ser. No. 220,153
Claims priority, application United Kingdom, Jul. 17, 1987, 8716955
Int. Cl.[5] A61B 19/00
U.S. Cl. 128—740 **1 Claim**

1. A method of examination of dermatomes for diagnostic purposes, the method comprising:

providing a dermatome testing instrument comprising a barrel member and a probe member, in which the probe member is slidable longitudinally relative to the barrel member and is resiliently biassed towards a position in which a tip region of the probe member extends from the barrel member, said probe member terminating distally in a tip formed to a rounded point;

lightly tapping the probe member against the skin of a patient; and

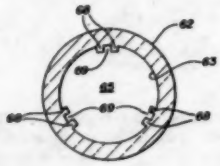
evaluating the response or reaction of the patient, the sensation experienced by that patient being primarily a function of the strength of the resilient biassing of the probe member in combination with the weight of the instrument.

4,964,413

FLOW INDUCING MEANS FOR SMALL VOLUME CONTAINERS

Robert J. Lousda, Astoria, N.Y., and Hugh T. Conway, Verona, N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 27,471, Mar. 18, 1987, abandoned, which is a division of Ser. No. 803,050, Nov. 29, 1985, Pat. No. 4,690,153. This application Jun. 14, 1988, Ser. No. 264,315
Int. Cl.[5] A61B 5/00
U.S. Cl. 128—766 8 Claims



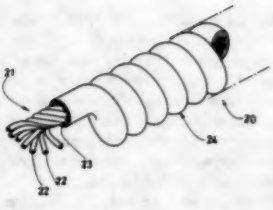
1. A blood microcollection container characterized by
(a) an elongated hollow body;
(b) said body having an open end and a closed end;
(c) walls defining said elongated hollow body extending from said open end to said closed end;
(d) said body walls including said closed end of said body;
(e) said walls of said body defining a hollow elongated chamber for receiving a collected blood sample;
(f) at least one elongated blood sample flow inducing member forming a portion of the chamber defining walls of said body; and
(g) said blood sample flow inducing member extending continuously from said open end to said closed end.

4,964,414

ELECTRODE FOR USE IN IMPLANTING IN A LIVING BODY

Yasunobu Handa, 7-4, Arigasaki 3-chome, Matsumoto-shi, Nagano-ken; Nozomu Hoshimiya, 5-3-403-11, Miyanomori Sanjyo 10-chome, Chuo-ku, Sapporo-shi, Hokkaido; Takashi Oda, c/o Nippon Seisen Co., Ltd., 45, Kourafbashi 5-chome, Higashi-ku, Osaka-shi, Osaka-fu, and Yoshinori Tanimoto, c/o Nippon Seisen Co., Ltd., 117-1, Ikenomiya 4-chome, Hirakata-shi, Osaka-fu, all of Japan

Filed Jun. 6, 1988, Ser. No. 202,812
Claims priority, application Japan, Aug. 27, 1987, 62-215882
Int. Cl.[5] A61N 1/05
U.S. Cl. 128—784 6 Claims



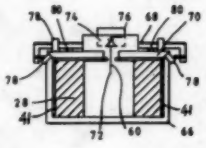
5. The electrode of claim 1 wherein the core is twisted into a strand which is coiled in the opposite direction from the coil of the resinous coating.

4,964,415

APPARATUS FOR DIATHERMY TREATMENT AND CONTROL

Lawrence E. Larsen, 308 Hamilton Ave., Silver Springs, Md. 20901

Division of Ser. No. 941,649, Dec. 15, 1986, Pat. No. 4,848,362. This application Jul. 17, 1989, Ser. No. 380,524
Int. Cl.[5] A61N 5/02
U.S. Cl. 128—804 8 Claims



1. Apparatus for deep heat treatment of musculoskeletal disorders, comprising
(a) a radio-frequency wave guide applicator and sensor (18) for producing therapeutic deep heat and for detecting a therapeutic response thereto; and
(b) means (58) for adjusting said applicator and sensor to an optimum wavelength, said adjusting means including
(1) a wave guide having transverse dimensions corresponding with those of said applicator and sensor;
(2) dielectric blocks (28) arranged within said wave guide;
(3) means (81, 82) connected with one end of said wave guide for energizing said wave guide to produce a wavelength therein, said wave guide being energized at the frequency at which said wave guide applicator and sensor is energized;
(4) means (74) for sensing the wavelength within said wave guide along the length thereof;
(5) means (41) for adjustably spacing said dielectric blocks from the walls of said wave guide to produce a critical wavelength therein corresponding to the free space wavelength at the frequency at which said wave guide is energized; and
(6) means (30) for mounting said dielectric blocks within said wave guide applicator and sensor, the spacing of said blocks within said wave guide applicator and sensor corresponding with the spacing within said adjusting means, whereby the optimum wavelength within said wave guide applicator and sensor is provided.

4,964,416

CONDOM ARTICLES, AND APPARATUS AND METHOD FOR MAKING AND USING THE SAME

Robin G. Foldesy, Raleigh, N.C., and Robert G. Wheeler, Greenbank, Wash.

Filed Nov. 15, 1988, Ser. No. 271,884
Int. Cl.[5] A61F 6/02, 6/04, 5/00
U.S. Cl. 128—842 25 Claims

1. A condom, comprising:

a generally tubular main sheath portion with a longitudinal axis, formed of an elastic material, closed at a distal end thereof, and open at a proximal end thereof to define an interior volume therein; and

at least one thin film annular-shaped interior volume sealing element which (1) annularly circumscribes an interior opening of smaller size than said proximal end opening, with an inner edge surface bounding the interior opening, and with top and bottom annular surfaces extending outwardly from said inner edge surface to an outer periphery of the sealing element, (2) is joined at the outer periphery at least at two diameterally opposite regions thereof to the main sheath portion, (3) is oriented with the top and bottom annular surfaces of the sealing element generally perpendicular to the longitudinal axis of the main sheath portion when the condom is positioned for donning, and (4) during insertion of a penis into the main sheath portion and subsequent wearing of the condom, circumscribes the penis, with the inner edge surface of the sealing element bearing compressively against the penis, to effect sealing of the condom on the penis.

4,964,417

WOUND CLOSURE DEVICE

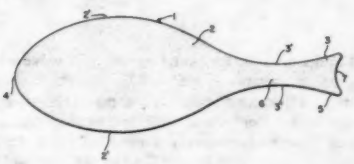
Joseph L. Peters, Crouch Hill, England, assignor to Clini-Med Ltd., Graves End and Clinical Product Development Ltd., Bucks, both of, England

Continuation of Ser. No. 52,854, Apr. 22, 1987, abandoned. This application Mar. 16, 1989, Ser. No. 324,430

Claims priority, application United Kingdom, Aug. 22, 1985, 8520999

Int. Cl.[5] A61B *17/00*

U.S. Cl. 128—850 **1 Claim**



1. A suture mat for temporary placement in a body to retain and protect body organs during surgical procedures and capable of being withdrawn from the body through a restricted opening therein, said mat comprising a sheet of flexible material comprising:

means for retaining a body organ against displacement and for removal from said body through an opening, said means being a thin body of oblong shape having bi-convex lenticular sides and having substantial lateral and longitudinal extent with the lateral extent greater than the opening, said means being uninflatable and of substantially uniform thickness, and

elongate means integral with said oblong retaining means extending from and longitudinally of said oblong retaining means for extraction of said retaining means from a body, said elongate extraction means having a lesser lateral extent than said oblong retaining means and a length greater than the lateral extent thereof and having sides are bi-concave with respect to said bi-convex sides,

each bi-convex side of said retaining means continuously curving into a respective concave side of said extraction means,

said extraction means having an end thereof remote from said retaining means, said retaining means having a rounded end portion opposite said extraction means, the end of said extraction means having a bi-concave curvature which substantially matches the rounded end portion of said retaining means,

said suture mat being without a center reinforcing piece and without means for causing said sheet to be in a substantially vertical plane when immersed in water.

4,964,418

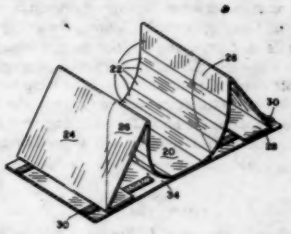
COLLAPSIBLE CERVICAL IMMOBILIZATION DEVICE

Maximilian J. Wilson, 5834 E. 62 Pl., Tulsa, Okla. 74136

Filed Feb. 16, 1988, Ser. No. 157,035

Int. Cl.[5] A61F *13/00*

U.S. Cl. 128—857 **2 Claims**



1. A collapsible cervical immobilization device for restraining the head and neck of an injured person, said device comprising:

An upper member and base member, each separated into multiple interconnected sections by hinges and wherein said upper member and base member are connected to each other, at their center sections; wherein the head and neck are supported and restrained by opposing sections of the device's upper member when folded into the desired position and secured to the base member by means of Velcro-type hook-loop fasteners attached to said upper member and base member.

4,964,419

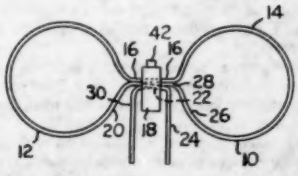
KEYLESS HANDCUFFS

Roy L. Karriker, P.O. Box #414, Marion, Va. 24354

Filed Aug. 2, 1989, Ser. No. 388,480

Int. Cl.[5] E05B *75/00*

U.S. Cl. 128—879 **2 Claims**



1. A pair of keyless handcuffs comprising a single flexible cord that includes a single loop connector section (16) at an intermediate point along the cord length, a first wrist-encircling loop section (14) extending away from one end of said connector section and then back toward said connector section, a first clampable section (28) extending from said first loop section in side surface contact with the connector section, and a first end section (30) extending from said first clampable section;

said flexible cord further including a second wrist-encircling loop section (12) extending away from the other end of said connector section and then back toward said connector section, a second clampable section (22) extending from said second loop section in side surface contact with said connector section (16), and a second end section (24) extending from said second clampable section; the first

clampable section (28) and the second clampable section (22) extending in opposite directions from their respective loop sections (14) and (12);

said keyless handcuffs further comprising a manually openable clamp device that includes a hollow housing having two aligned cord openings (36 and 37) formed therein, a manually-movable cord crimping mechanism within said housing, said crimping mechanism being movable between a cord-disengaged position in which it forms a single straight passage between the aligned openings and a cord-crimping position in which it forms a single U-shaped passage between the aligned openings, and a spring within the housing normally biasing the crimping mechanism to its cord-crimping position except when the mechanism is manually moved to its cord-disengaged position;

said flexible cord being oriented to said clamp device so that said loop connector cord section (16) and the two clampable cord sections (28 and 22) extend together through the crimping mechanism passage and aligned openings.

4,964,420

DISTRIBUTOR

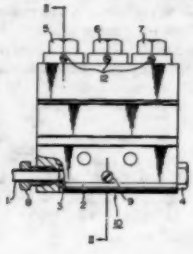
Minoru Ichikawa, Owariasahi; Kotaro Kashiyama, Isuyama, and Tomomitsu Furukawa, Nagoya, all of Japan, assignors to Daido Metal Company, Nagoya, Japan

Continuation of Ser. No. 293,678, Jan. 5, 1989, abandoned. This application Nov. 3, 1989, Ser. No. 431,728

Claims priority, application Japan, Jan. 29, 1988, 63-19079

Int. Cl.[5] F01M *1/00*

U.S. Cl. 137—171 **1 Claim**



1. A distributor for distributing lubricating fluid through a main pipe of a piping system, said distributor having a main body and comprising:

a main flow passage passing through the main body;

discharge ports connected to said main flow passage;

a blind screw for closing one end of said main flow passage; and

deaerating valves disposed in connection with each of said main flow passage and said discharge ports, adapted to be selectively opened and closed wherein said deaerating valves are adapted to be opened to allow air and a part of the lubricating fluid to escape from said distributor, and

wherein said deaerating valves are disposed substantially perpendicularly with respect to the respective main flow passage and discharge port with which the deaerating valves are connected.

4,964,421

WATER SAVER VALVE

Joseph C. Klaus, 2545-Pheasant Run, Wexford, Pa. 15090

Filed Aug. 2, 1989, Ser. No. 388,008

Int. Cl.[5] F16K *17/32*

U.S. Cl. 137—460 **12 Claims**

1. A valve device comprising:

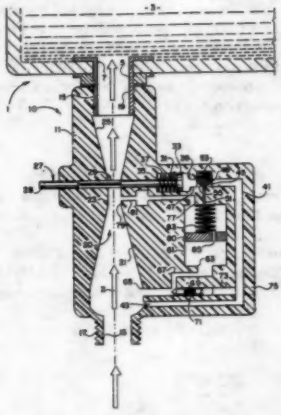
(a) a housing having an inlet, an outlet and a passageway therebetween, said passageway including, in a direction from said inlet to said outlet a converging section, a throat and a diverging section;

(b) valve means for controlling fluid flow in said passageway, said valve means having a first open position and a second closed position,

(c) actuator means for said valve means for controlling actuation thereof, said actuator means comprising:

(i) a fluid motor connected to said valve means and a motor passageway fluidly communicating said fluid motor with said passageway upstream of said throat; elongated in a direction of said further fluid motor

(ii) a pilot valve including a stem and a valve head connected to said stem and controlling flow through said motor passageway;



(iii) a pilot actuator for actuating said pilot valve including a motor chamber in which a further fluid motor may move, a first conduit fluidly communicating one side of said further fluid motor with fluid pressure upstream of said throat and a second conduit fluidly communicating another side of said further fluid motor with said throat;

(iv) a variable restrictor in said first conduit, and;

(v) said further fluid motor being unconnected to said pilot valve but engaging said pilot valve stem when differential pressure across said sides of said further fluid motor exceeds a desired amount to open said pilot valve and allow fluid pressure in said motor passageway to close said valve means.

4,964,422

BUTTERFLY-TYPE CHECK VALVE

Larry K. Ball, Chandler, and Marshall U. Hines, Scottsdale, both of Ariz., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Aug. 17, 1989, Ser. No. 395,234

Int. Cl.[5] F16K *15/03*

U.S. Cl. 137—512.1 **15 Claims**

1. A butterfly-type check valve, comprising:

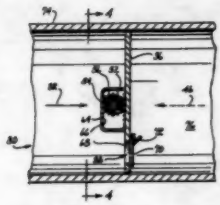
a duct defining an elongate flow path for fluid

a shaft supported across said duct and extending transversely across said flow path, said shaft defining a longitudinal axis:

a plate-like valve member having a hole formed therethrough; said member being disposed in said flow path substantially parallel to said shaft: said member being secured to said shaft such that said member is capable of both revolutionary and translational movement relative to said axis; and

gating means secured to said member and cooperable there-

with for forming a secondary check valve that is operable to permit flow through said hole in one direction and to



substantially prevent flow through said hole in an opposite direction.

4,964,423

CHECK VALVE

Theodore J. Gausman, Mentor, and Gary W. Scheffel, Streetsboro, both of Ohio, assignors to Nupro Company, Willoughby, Ohio

Continuation-in-part of Ser. No. 239,557, Sep. 1, 1988, Pat. No. 4,856,555. This application Aug. 14, 1989, Ser. No. 392,888

The portion of the term of this patent subsequent to Aug. 15, 2005, has been disclaimed.

Int. Cl.[5] F16K *15/02*

U.S. Cl. 137—543.17 **20 Claims**

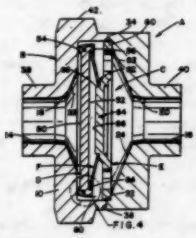


FIG. 4

1. A check valve comprising:

first and second body portions which define a valve chamber;

an inlet and an outlet communicating with said valve chamber;

a valve element received in said valve chamber for selective movement in response to pressure differentials;

a stop member received in said valve chamber for limiting opening movement of said valve element; and

a guide member interposed between said valve element and stop member for urging said valve element toward a closed portion, a radially inner portion of said guide member operatively associated with a radially inner portion of said stop member and a radially outer portion of said guide member operatively associated with a radially outer portion of said valve element.

4,964,424

PNEUMATIC VALVE ASSEMBLY FOR CONTROLLING A STREAM OF COMPRESSED AIR

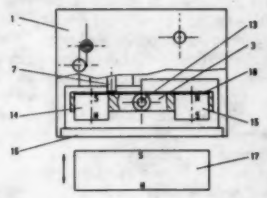
Roland Helbig, Trossingen, and Karl Trittler, Aldingen, both of Fed. Rep. of Germany, assignors to Hengstler GmbH, Aldingen, Fed. Rep. of Germany

Filed Apr. 10, 1989, Ser. No. 335,756

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1988, 3812769

Int. Cl.[5] F15B *13/042*

U.S. Cl. 137—557 **16 Claims**



1. In a pneumatic valve assembly for controlling a compressed air stream in response to a non-contacting actuation, which assembly comprises

a housing means formed with a valve passage for conducting said compressed air stream through said housing means and

a valve piston which is movably mounted in said housing means and operable to open and close said valve passage,

the improvement residing in that said valve assembly further comprises

a pilot orifice provided in said housing means,

orifice control means for opening and closing said orifice,

a lever, which is pivoted to said housing means and carries permanent magnet means, which are adapted to impart to said lever a pivotal movement for actuating said orifice control means in response to a movement of a magnetic actuating member into the proximity of said permanent magnet means, and

means for supplying said orifice with a pilot air stream for operating said valve piston when said orifice is open.

4,964,425

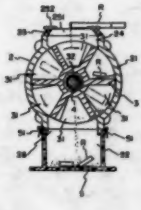
STRUCTURE OF AN ASHTRAY, CAPABLE OF SELF-CLEANING AND AUTOMATIC FIRE-EXTINGUISHING

Hui-Hsiung Chang, No. 10, Hsin Kung 4th Road, Tien-Chung Chen, Changhua Hsien, Taiwan

Filed Apr. 21, 1988, Ser. No. 184,458

Int. Cl.[5] A24F *13/18*

U.S. Cl. 131—237 **2 Claims**



1. A structure of ashtray capable of self-cleaning and automatic fire-extinguishing, comprising,

a housing having a cylindrical hollow body portion with upper, lower, left-side and right-side openings, and

said cylindrical hollow body having an upper opening and a lower opening and curved inner walls;

a pair of side covers attached bilaterally to said hollow body by means of respective locking pins, each said side cover having an axial bore and a bearing which has an axial bore, each of said bearings being coaxially arranged with the bore in its respective side cover;

a frame mounted on said housing and having an inlet which is in alignment with the upper opening of said cylindrical hollow body portion, and a plurality of curved radial grooves arranged around said inlet on said frame plate for temporary placement of burning cigarettes;

a container mounted beneath the housing for collection of ashes, cigarette butts and/or garbage;

a fastening element mounted inferiorly and externally on the housing and connecting the housing with the container;

a dust collecting drum having a core with a bore extending therethrough, said dust collecting drum being rotatably mounted inside the cylindrical body portion between the upper opening and the lower opening of the housing with its periphery closely in contact with the inner wall of the cylindrical hollow body portion;

said dust collecting drum having,

a plurality of radial collecting chambers arranged around the core of the dust collecting drum, said collecting chambers of the dust collecting drum each having a broader radial outer opening than its radial inner bottom for facilitating the deposition of garbage contained inside said chambers;

a rotatable shaft, inserted through the bore of each side cover of the housing and through the bore of the dust collecting drum with both ends protruding beyond the respective side covers for controlling the rotating motion of the dust collecting drum;

a handle bar attached at each end of said rotatable shaft for operating said rotatable shaft;

wherein the structure of the ashtray is such that by means of the above-described arrangement, the inner space of the container is hermetically sealed so that any burning cigarette butt that has been thrown into a chamber will be promptly extinguished; and

wherein each side cover has an air hole to facilitate the rotating of the dust collecting drum against the housing.

4,964,426

TOBACCO SMOKE FILTERS AND PROCESS FOR PRODUCTION THEREOF

Benedict M. Lee, and James E. Harris, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 28, 1988, Ser. No. 250,690

Int. Cl.[5] A24D *3/16*

U.S. Cl. 131—342 **15 Claims**

1. A tobacco smoke filter material comprising a fibrous or sheet tobacco smoke filter element having surfaces for exposure to tobacco smoke, wherein said filter element has micro acicular crystals of a compound present on said surfaces in an amount of at least about 1 weight percent based on the weight of said filter material.

4,964,427

SMOKING ARTICLES

Paul D. Case, and David J. Dittrich, both of Southampton, England, assignors to British-American Tobacco Company, Ltd., London, England

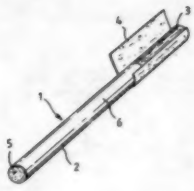
Filed Sep. 2, 1988, Ser. No. 239,913

Claims priority, application United Kingdom, Sep. 3, 1987, 8720726; Dec. 16, 1987, 8729389

Int. Cl.[5] A24D *1/02*

U.S. Cl. 131—365 **14 Claims**

1. A smoking article comprising a smoking material rod, which rod comprises smoking material and a paper wrapper circumscribing said smoking material, the density of said smoking material in said rod being in a range of about 100 mg cm^{-3} to about 260 mg cm^{-3}, said smoking material comprising at least about 20% by weight of expanded tobacco, said wrapper



comprising from 2.6% to 14% of a burn retardant and said smoking article, when smoked under standard machine smoking conditions, providing not less than six puffs.

4,964,428

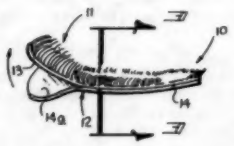
ARTIFICIAL EYEBROW CONSTRUCTION

Barbara A. Lamatrice, 3215 Chemehueui Blvd., Lake Havasu, Ariz. 86403

Filed Sep. 27, 1989, Ser. No. 413,204

Int. Cl.[5] A45D *40/30*

U.S. Cl. 132—216 **1 Claim**



1. An artificial eyebrow construction comprising,

a flexible planar support membrane defining an arcuate perimeter, and

securement means for mounting the support membrane onto a forehead surface of an individual, and

a plurality of rows of base filaments directed longitudinally of the support membrane, and

a matrix of eyebrow filaments secured to the base filaments, and

wherein the flexible planar support membrane is formed of a thin, polymeric material, and

wherein the securement means includes an adhesive laminated to a bottom surface of the support membrane, and

further including a flexible, polymeric backing surface removably mounted to the adhesive, wherein the adhesive is defined as a laminated sheet coextensive with the bottom surface of the support membrane, and includes a finger grasping tab extending exteriorly of the backing surface formed in a single plane therewith, and

wherein the base filaments are defined by elongate human hair filaments, and

wherein the eyebrow filaments are defined by "U" shaped human hair filaments secured to each of the base filaments, and

wherein each of the "U" shaped human hair filaments is offset relative to a "U" shaped hair filament in an adjoining row or human hair filaments secured to an adjacent base filament, and

wherein "U" shaped human hair filaments of adjacent rows are of varying cross-sectional thickness.

4,964,429

COSMETICS APPLICATOR

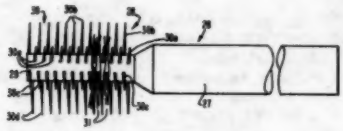
Rodney D. Cole, Welbeck House, High Street, Guildford, Surrey, United Kingdom

Filed Mar. 25, 1988, Ser. No. 173,123

Claims priority, application United Kingdom, Mar. 25, 1987, 8707086

Int. Cl.[5] A45D 40/26

U.S. Cl. 132—218 16 Claims



5. An eyelash applicator for a liquid, semi-liquid, creamy, paste-like or viscous cosmetics material comprising a handle portion and a head portion having a stem and a multiplicity of flexible elements projecting laterally therefrom for retaining and applying said material, said multiplicity of elements being arranged along said stem to form between said elements interstices of a converging configuration with interstices of other said elements to thereby grip eyelashes for applying said material thereto when the applicator is drawn through the eyelashes during use.

4,964,430

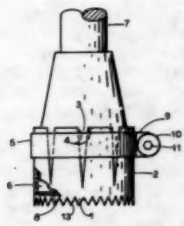
WALKING AID ICE GRIPPER

William F. Janis, 980 Montgomery Rd. #15, Altamonte Springs, Fla. 32714

Filed May 15, 1989, Ser. No. 351,576

Int. Cl.[5] A45B 9/06; A61H 3/02

U.S. Cl. 135—78 13 Claims



1. An ice-gripper for a walking-aid having a downward end with an outside periphery, said ice-gripper comprising:

a solid tubular gripper member of hard material having first and second ends said first end sized and shaped to fit over the outside periphery of the downward end of said walking aid, said tubular member having one or more selectively sized linear openings extending from said first end into said solid tubular gripper member and permitting the solid tube to be compressed over said outside periphery;

a series of pointed edges circumferentially around said second end of said solid tubular member;

a base member projected radially inward from the inside periphery of the tubular gripper member; and

a ring-like strap member for securely attaching the tubular member to the downward end of a walking aid, said strap member being sized to fit around the tubular member over the linear openings and having means for drawing opposite sides of the openings towards each other radially.

4,964,431

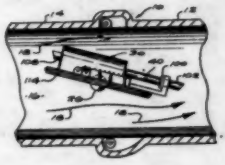
BUTTERFLY VALVE APPARATUS AND METHOD

Larry K. Ball, Chandler; Marshall U. Hines, Scottsdale, and Terry L. Miller, Mesa, all of Ariz., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Oct. 16, 1989, Ser. No. 422,210

Int. Cl.[5] F16K 1/22

U.S. Cl. 137—1 34 Claims



32. A method of controlling fluid flow in a duct, and duct having a wall bounding a flow path wherein flows said fluid; said method including the steps of:

disposing a plate-like valve member in said flow path, which valve member is pivotally movable about an axis generally transverse to said duct between a first position transverse to and closing said flow path and a second position generally parallel with said flow path to open and allow fluid flow therein:

transecting said valve member with said pivot axis to define with respect to direction of said fluid flow in said duct and pivotal movement of said valve member toward said open position an upstream valve member wing and a downstream valve member wing each substantially equal in area:

increasing the effective area of said valve member upon which said fluid flow exerts fluid dynamic flow forces; and

pivoting said valve member toward said second open position thereof in response to said increase of effective area.

4,964,432

METHOD AND MEANS FOR MOUNTING VALVE MEMBER ON VALVE STEM

Alan F. Chou, Sugar Land, Tex., assignor to Keystone International, Inc., Houston, Tex.

Filed Mar. 19, 1990, Ser. No. 495,162

Int. Cl.[5] F16K 43/00, 1/02, 31/50

U.S. Cl. 137—15 16 Claims

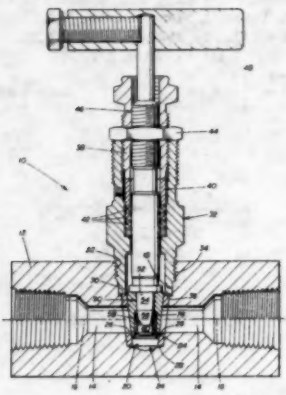
14. A method of assembling a hollow frustoconical valve member onto an extending end portion of a valve stem for moving the valve member between open and closed positions relative to a fixed valve seat; said method comprising:

providing a central bore through said valve member and forming an inner annular shoulder about said bore facing inwardly;

providing a frustoconical section on said extending end portion of the valve stem to define an outwardly facing annular should adjacent the end of said valve stem in spaced opposed relation to said inwardly facing shoulder;

then mounting a pair of frustoconical connector halves about the frustoconical section of the valve stem between the stem and valve member with the connector halves between said opposed annular shoulders; and

next mounting a removable retaining sleeve onto the extending end portion of said stem and about the frustoconical



halves for removably retaining said connector halves thereon between said opposed shoulders.

4,964,433

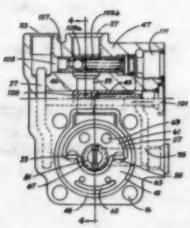
ROTARY VALVE

Walter E. Marietta, Racine, Wis., assignor to Sta-Rite Industries, Inc., Milwaukee, Wis.

Filed Feb. 14, 1990, Ser. No. 480,085

Int. Cl.[5] F15B *13/04*; F16K *11/072*

U.S. Cl. 137—115 **16 Claims**



1. A rotary valve including:

a valving block having a valve interface with a first work port and a second work port formed in the interface for flowing fluid between the rotary valve and the block;

a valve body attached to the block and having an inlet conductor for connection to a source of fluid and a discharge conductor for connection to a downstream device;

a rotatable valve plate received in the body and having a working face and an opposed face, the working face including a continuous land in contact with the valve interface, the land being configured to segregate the cavity adjacent the working face into a pressure region and a discharge region;

a rotatable stem received in the body and coupled to the valve plate for causing rotational movement thereof, the stem having an axial passage in fluid communication with the pressure region and having at least one aperture for intersecting the inlet conductor and controllably metering fluid from the inlet conductor into the pressure region;

each of the work ports being in fluid communication with the pressure region and the discharge region when the valve plate is in the neutral position, the stem and the plate being rotatable to an operating position wherein one of the work ports is in fluid communication with only the pressure region and the other of the work ports is in fluid communication with only the discharge region;

a flow controlling mechanism in operative relationship to the body for limiting, over a range of operating positions, the flow of fluid from the inlet conductor to a work port;

the rotary valve thereby being arranged for controlling the speed of a hydraulic device attached to the valving block.

4,964,434

DUAL CONTROL VALVE SUITABLE FOR HIGH PRESSURE FLUIDS

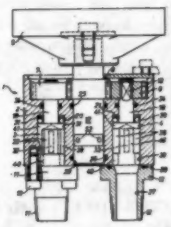
Hans Bierl, Pfäffikon, Switzerland, assignor to Hydrostress AG, Pfäffikon, Switzerland

Filed Feb. 5, 1990, Ser. No. 475,145

Claims priority, application Switzerland, Feb. 17, 1989, 00568/89

Int. Cl.[5] F16K *11/18*

U.S. Cl. 137—567 **20 Claims**



1. Multi control valve suitable for high pressure fluid use comprising

a housing (2), said housing being formed with two inlet means (11, 12), each adapted for connection to a source (64, 62) of highly pressurized fluid;

two bores (30, 31) formed in the housing, wherein the respective bores (30, 31) and the respective valve elements (3, 4) therein are located in the housing with the axes of the bores in essentially parallel alignment, each bore communicating with a respective one of the inlet means;

two outlet openings (32, 33) formed in said housing, each communicating with a respective one of said bores;

a rotatable valve element (3, 4) located in each of said bores, each rotatable valve element (3, 4) having four control positions, offset by 90° relative to each other and being formed with a blind bore (22, 23) coaxial with the respective valve element and defining, between the outer surface of the valve element and said blind bore, a valve sleeve,

said valve sleeve element communicating with a respective one of the inlet means, and

said valve sleeve being formed with at least one lateral cut-out (38, 39) communicating with a respective blind bore;

wherein said lateral cut-outs (38, 39) of the valve elements (3, 4) and said outlet openings (32, 33) in the housing (2) are respectively positioned to, selectively, establish communication between the respective inlet means and the associated outlet opening communicating with the respective one of said bores to establish an OPEN position of the respective valve element, or inhibit said communication by placing a portion (46, 47) of the valve sleeve adjacent the respective cut-out (39, 38) of the valve sleeve adjacent the respective outlet openings to establish a CLOSED, or blocked position;

wherein said portion (47) of the valve sleeve of one (3) of said valve elements is, in cross-section, essentially semi-circular, whereby said cut-out will be essentially semi-circular;

wherein the portion (46) of a second one (4) of said valve elements form two diametrically opposite sleeve portions, and the cut-outs (39) form diametrically opposite communicating openings between said blind bore (23) in said element and the circumference thereof,

whereby said first valve element will define two adjacent circumferential positions, 90° offset relative to each other, which establish the OPEN positions and the CLOSED positions, and the second valve element (4) will establish two sequential OPEN-CLOSED positions offset 90° relative to each other; and

wherein pressure of the pressurized fluid within the blind bore presses against the respective outlet opening to effect a tight seal thereagainst.

4,964,435

SHUTTLE VALVE

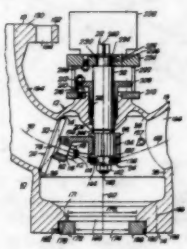
Walter Powell, Sugarland, Tex., assignor to Disco, Italy

Filed Apr. 27, 1989, Ser. No. 344,971

Claims priority, application European Pat. Off., Jan. 2, 1989, 8910013

Int. Cl.[5] F16K *3/22, 1/26*

U.S. Cl. 137—625.41 **19 Claims**



1. A shuttle valve comprising a valve housing including a primary aperture and a pair of secondary apertures whereby a fluid can flow between said primary aperture and one of said pair of secondary apertures, self-aligning valve means within said housing, said self-aligning valve means including setting means for closing one of said pair of secondary apertures, said seating means comprising valve disc means including a valve disc seating surface defining a partial spherical surface and corresponding secondary aperture seating surfaces on each of said pair of secondary apertures defining corresponding partial spherical surfaces, said valve disc means comprising a disc face portion including a first surface including said valve disc seating surface and a second surface, and a transversely extending stem portion extending from a central portion of said second surface for a predetermined stem distance and having a stem axis, said valve disc seating surface having a radius whereby the center of a sphere defined by said partial spherical surface of said valve disc seating surface is aligned with said stem axis at a location beyond said predetermined stem distance, said second surface of said valve disc means including a partial spherical surface surrounding said stem portion and having a radius whereby the center of said sphere defining said partial spherical surface of said second surface of said valve disc means is aligned with said stem axis at a location facing said first surface of said valve disc means, and valve actuating means for selectively closing said one of said pair of secondary apertures with said seating means by moving said seating means between positions corresponding to said one of said pair of secondary apertures along a first predetermined path and for moving said seating means into seating engagement with said one of said pair of secondary apertures along one of a pair of second predetermined paths associated with said one of said pair of secondary apertures, said second predetermined path being substantially transverse to said first predetermined path, said valve actuating means comprising rotary drive means for rotatably moving said seating means along said first predetermined path, said first predetermined path comprising a generally circular path, said rotary drive means including longitudinally extending spindle means extending into said valve housing and having a spindle axis, and said seating means including valve disc lever means mounting said valve disc means eccentrically with respect to said spindle axis of said spindle means, said center of said sphere defining said partial spherical surface of said valve disc seating surface lying substantially on said spindle axis.

4,964,436

VALVE WITH ROTARY VALVING ELEMENT

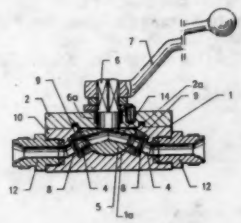
Alfred Hein, Mettlach, Fed. Rep. of Germany, assignor to MHA Zentgraf Merziger Hochdruck-Armaturen GmbH & Co., Merzig, Fed. Rep. of Germany

Filed Dec. 28, 1989, Ser. No. 458,080

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1989, 3914327

Int. Cl.[5] F16K *00/00*

U.S. Cl. 137—625.47 **8 Claims**



1. A valve comprising a housing including a first section having a surface provided with a socket, said first section further having first and second pairs of fluid-conveying passages communicating with said socket; a rotary valving element disposed in said socket and having fluid-conveying first and second channels; means for rotating said valving element relative to said first section between at least one first position in which said first channel establishes communication between the passages of said first pair and said second channel establishes communication between the passages of said second pair and at least one second position in which said channels are sealed from said passages, said housing further including a second section overlying said surface to retain said valving element in said socket, said rotating means extending through and outwardly from one of said sections; and stressed sealing elements operating between said valving element and said first section to prevent leakage of conveyed fluid into said socket.

4,964,437

APPARATUS AND METHOD FOR CONTROL OF OIL LEAKAGE FROM DAMAGED TANKER

Edmund G. Tornay, New York, N.Y., assignor to Energy Transportation Group, Inc., New York, N.Y.

Filed Dec. 15, 1989, Ser. No. 451,103

Int. Cl.[5] B63B *25/08*

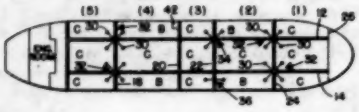
U.S. Cl. 137—1 **7 Claims**

1. Method for controlling leakage of oil from a damaged tanker of the type that is divided by longitudinal and transverse vertically-oriented bulkheads arranged to form a plurality of

tanks, some dedicated for carriage of oil and others dedicated for carriage of water ballast and empty when the tanker is fully loaded, comprising the steps of:

connecting normally closed conduits from each cargo tank to at least one ballast tank through a common bulkhead at an elevation below the oil level of a fully loaded tanker and a selected height above the bottom of the tanker;

sensing a rupture in an oil cargo tank and in response generating an indicating signal,



in response to an indicating signal opening one or more of the conduits connected to an oil cargo tank determined to be ruptured and transferring oil out of the upper part thereof by gravity flow to one or more empty ballast tanks, and

redistributing the tanker's oil cargo to minimize outflow of oil form the rupture and to control within safe limits the tanker's trim, heel, sinkage and stability.

4,964,438

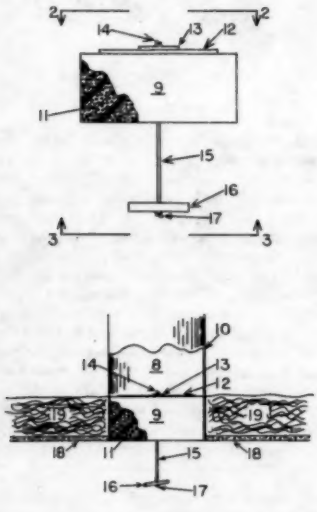
AIR DUCT PLUG

Ronald S. Welty, 1605 Crown Dr., Reno, Nev. 89503, assignor to Ronald S. Welty, Reno, Nev.

Filed Oct. 2, 1989, Ser. No. 415,969

Int. Cl.[5] F16L *55/10*

U.S. Cl. 138—89 **1 Claim**



1. A plug for the purpose of obturating an open end of an air duct during periods of nonuse comprising:

a resilient plug body larger than the aperture of the air duct to be obturated with a body wall complimentary to the shape of said air duct, providing a compressive and frictional engagement of the outer surface or walls of the plug body with the inner surface of said air duct, said body being of substantial thickness, when inserted into an active position, obstructs said air duct while providing insulative qualities;

a support base made of a rigid material and shaped in a complimentary fashion to said body and provided with a center aperture;

a reinforcement ring, integrally connected to said support base, also made of a rigid material, shaped in a complimentary fasion to said body so as to strengthen said support base, and is also provided with a center aperture substantially equal in diameter and axially parallel with said support base aperture;

a depending handle with a connecting means of predetermined length running axially through the plug body, support base, and reinforcement ring and secured at both ends by non fraying knots.

4,964,439

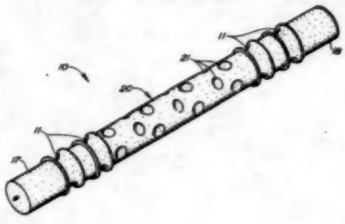
PIPE PLUG WITH CIRCUMFERENTIAL SUCTION CUPS

Gerald J. Vanderlans, 1310 W. Turner Rd., Lodi, Calif. 95240

Filed Apr. 18, 1989, Ser. No. 339,684

Int. Cl.[5] F16L *55/12*

U.S. Cl. 138—93 **6 Claims**



1. An inflatable pipe plug, comprising

a tubular all-rubber member having one end closed and an end through which air may be pumped into said tubular member, said member having a tubular end portion,

said end portion having a series of plug body portions alternating with a series of pairs of flexible inclined ribs that are thin at their outer ends and join a plug body portion at a thicker inner end portion, each pair of ribs having between them a concave expandable ring that normally lies radially within said plug body, each said rib lying at about 10° to its adjoining said body portion so that it faces away from said concave ring,

whereby when said plug is installed into a pipe, it is freely movable inside said pipe to a desired position and can then be pneumatically expanded so that said concave rings expand and grip the pipe wall surfaces and said thin angular ribs move to grip both the plug and the pipe.

4,964,440

RIBBED PIPE

James R. Andre, P.O. Box 2450, Newport Beach, Calif. 92658, and Larry Daniels, 43 Andreas Ct., Novato, Calif. 94945

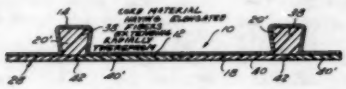
Division of Ser. No. 260,816, Oct. 21, 1988, Pat. No. 4,838,317, which is a continuation of Ser. No. 579,319, Feb. 13, 1984, abandoned, which is a continuation-in-part of Ser. No. 196,180, Oct. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 896,374, Apr. 14, 1978, abandoned. This application May 16, 1989, Ser. No. 352,411

Int. Cl.[5] F16L *11/08*

U.S. Cl. 138—122 **7 Claims**

1. A substantially rigid pipe particularly for use in buried storm drain and sanitary applications, said pipe comprising a cylindrical metal wall having a helically extending lock seam and defining a plurality of outwardly projecting walled structural supporting ribs extending helically about and along the length of said pipe and being integrally formed therewith, said

ribs defining a corresponding plurality of open channels formed interiorly thereof, the walls of said ribs converging inwardly toward the open end of said channels thereby reducing the transverse dimension of said open end of said channels, said cylindrical wall being of constant radius between said channels and said open channels being sized and relatively spaced from one another to render the pipe substantially rigid



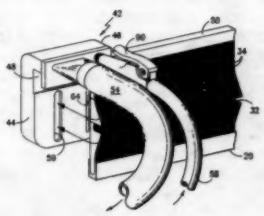
and possess sufficient structural strength to withstand the stresses of being buried underground, a filler material disposed within said channels and held therein by the reduced transverse dimension of said open end of said channels, and a protective liner interfacing the interior sides of said cylindrical wall of said pipe, said liner being secured to said filler material within said channels thereby anchoring said liner to said filler material and against said cylindrical wall of said pipe.

4,964,441

FOAM CLEANER FOR LOOM REEDS

Wayne H. Long, Anderson, and Francis M. Wardlaw, Jr., Honea Path, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Aug. 15, 1989, Ser. No. 393,892
Int. Cl.[5] D03D *49/00*
U.S. Cl. 139—1 C **4 Claims**



1. A method to clean the reed of a weaving machine without removing the reed from the machine comprising the steps of: placing a cleaning head on top of the top of the reed, sliding the cleaning head from one end of the reed to the other end of the reed while simultaneously blowing a foaming agent from the cleaning head through the spaces between the dents of the reed to dislodge lint, trash, etc. therefrom and sucking the dislodged lint, trash, etc. back through the spaces between the dents in the reed into the cleaning head for collection at a point of collection.

4,964,442

RESERVE WEFT THREAD SUPPLY MECHANISM WITH DEVICE FOR CHANGING THREAD TYPE

Jo Tacq, Ieper; Roger Ligneel, Beselare, and Henry Shaw, Vleteren, all of Belgium, assignors to Picanol N.V., Belgium

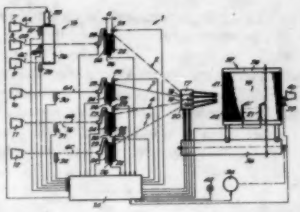
Filed Jun. 16, 1989, Ser. No. 366,622
Claims priority, application Belgium, Jun. 17, 1988, 08800687
Int. Cl.[5] D03D *47/30, 47/36*
U.S. Cl. 139—452 **15 Claims**

1. A mechanism for supplying a weft thread to the shed of a weaving machine, comprising:

first weft thread supply means for supplying a first type of weft thread from a first weft thread source to the shed;

second weft thread supply means for supplying a second type of weft thread from a second weft thread source to the shed;

third weft thread supply means for supplying one of a plurality of different types of weft threads from one of a plurality of third weft thread sources to the shed; and



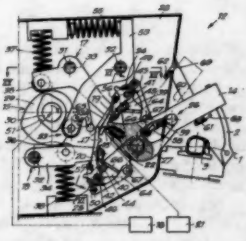
weft thread selection means for selecting the type of weft thread to be supplied by said third weft thread supply means, said weft thread selection means including means for selecting one of the plurality of third weft thread sources and providing said third weft thread supply means with thread from the selected third weft thread source.

4,964,443

WEFT MIXER

Philippe Van Bogaert, Schaarbeek; Denis Moeneclaey, Westrozebeke-Staden, and Remi Lagache, Zillebeke, all of Belgium, assignors to Picanol N.V., Belgium

Filed Jun. 16, 1989, Ser. No. 366,628
Claims priority, application Belgium, Jun. 17, 1988, 08800691
Int. Cl.[5] D03D *47/38*
U.S. Cl. 139—453 **16 Claims**



1. A mechanism for presenting weft threads on weaving machines during a plurality of weaving cycles, said weaving machine operating at a particular machine speed, comprising:

a plurality of thread presentation arms which swivel to and fro between two positions;

a cam mechanism;

drive means for driving said cam mechanism at half said machine speed;

two cam follower devices supported by means for permitting the cam follower devices to move independently of each other in response to movement of said cam mechanism;

armature means including two armatures for each thread presentation arm, each armature connected to a respective cam follower device, for moving the thread presentation arms between said two positions in response to movement of the cam follower devices upon engagement with the thread presentation arms;

engagement means to enable a plurality of said armatures to

engage their respective thread presentation arms during each weaving cycle, at particular moments and during a particular period;

disengagement means to force said armatures to disengage said thread presentation arms; and

holding means to hold the thread presentation arms in a position into which they have been moved by the armatures,

wherein said cam mechanism and the cam follower devices impart reciprocating movements to the armatures such that, alternately, for each successive weaving cycle, the armatures connected to one of the cam follower devices cause the movement of one of the thread presentation arms into a presented position, while the armatures connected to the other cam follower device move back to a rest position a thread presentation arm which has just been presented.

4,964,444

APPARATUS FOR CLEANING A FILLING PIPE

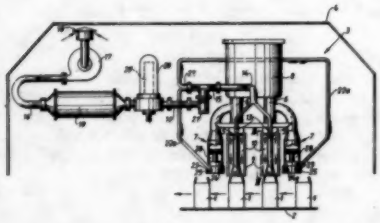
Göran Hanérus, Malmö, and Tommy Ljungström, Höör, both of Sweden, assignors to Roby Teknik Aktiebolag, Lund, Sweden

Filed Mar. 20, 1989, Ser. No. 326,176

Claims priority, application Sweden, Mar. 21, 1988, 8801029

Int. Cl.[5] B67C *3/22*

U.S. Cl. 141—90 **7 Claims**



1. An arrangement on a packing machine comprising a product filling pipe having an opening at one end; a tubular casing element arranged around said product filling pipe so as to form a free flow space between the product filling pipe and the casing element, said casing element having a connecting means; an outer duct being in fluid communication to an outer duct for flowing fluid through said connecting means arranged on the casing element, said casing element having an end facing said opening of the product filling pipe, said end closable by a detachable lid element to form a container that substantially encloses the product filling pipe to allow circulation of a cleansing fluid, said outer duct being connected to an air supply duct by a T-shaped junction piece, said air supply duct being connected to a blower having an air intake, a heat exchanger and a sterile filter device, said air supply duct having a valve for selectively opening or closing a fluid communication between said air supply duct and said outer duct.

4,964,445

APPARATUS FOR FILLING A LIQUID FRICTION COUPLING

Gottfried Weinberger, Graz, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Jul. 6, 1989, Ser. No. 376,637

Claims priority, applicatioc Austria, Jul. 20, 1988, 1861/88

Int. Cl.[5] B65B *3/00*

U.S. Cl. 141—346 **4 Claims**

1. An apparatus for supplying viscous liquid to a liquid friction coupling, comprising

plug connector means adapted to be connected to said liquid friction coupling,

a metering pump for supplying said viscous liquid to said liquid friction coupling,

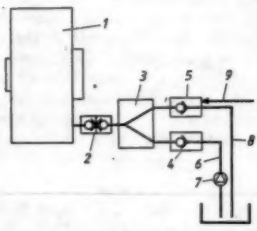
a discharge line connecting said metering pump to said plug connector means,

a return line connected to said plug connector means,

a junction through which said discharge line, said return line, and said plug connector means communicate with each other,

first non-return valve means disposed in said discharge line for supplying said viscous liquid to said liquid friction coupling,

second non-return valve means disposed in said return line for removing excess viscous liquid from said liquid friction coupling,



said first and second non-return valve means being configured to operate normally in the same direction so that said first non-return valve means has a direction of flow from said discharge line to said junction and said second non-return valve means has a normal direction of flow from said return line to said junction,

each of said first and second non-return valve means normally preventing a flow of liquid from said junction through said non-return valve means, and

valve-controlling means for opening said second non-return valve means opposite to its normal direction of flow thereby to permit liquid to flow from said junction through said second non-return valve means and into said return line.

4,964,446

MACHINE FOR SURFACE AND THICKNESS WORKING OF SHORT AND THIN WORKPIECES

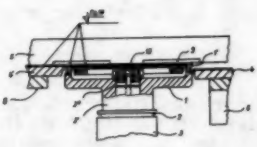
Pavel Lodinek, Pivolska 31, YU-62000 Maribor, Yugoslavia

Filed Sep. 18, 1989, Ser. No. 408,630

Claims priority, application Yugoslavia, Feb. 17, 1989, 374/89

Int. Cl.[5] B27L *11/00*; B27C *1/00*

U.S. Cl. 144—114 R **20 Claims**



1. A machine for surface finishing short and thin workpieces which are too small to be clamped for finishing, comprising a working table supporting a movable slide plate and a stationary slide plate defining therebetween a sliding path for said workpiece, means for moving said working table in at least two planes, at least one spindle drivingly supporting a milling head, a pair of flank guide strips and a vertically adjustable upper slide guide for guiding the workpiece toward said milling head,

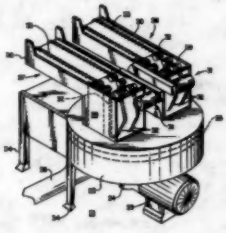
said milling head having a concentric hollow face, said milling head being provided with peripheral interchangeable cutting edges, a guide insert insertable into said hollow face, and means for fixedly securing said guide insert to one of said flank guide strips, whereby said workpiece, as it moves past said milling head, is supported by said guide insert.

4,964,447

FLAT DISK FLAKER

Eugene A. Farrell, Fishers Landing, and Mark D. Robinson, Black River, both of N.Y., assignors to Carthage Machine Company, Carthage, N.Y.

Filed Nov. 17, 1989, Ser. No. 437,589
Int. Cl.[5] B27C *1/00*
U.S. Cl. 144—176 **7 Claims**



1. A horizontal disk multiple continuous feed wood flaker comprising:

a. a rotary cutting disk that is horizontally disposed with a vertical axis and having on an upper surface a plurality of radially oriented cutting groups each with an elongated flaker knife and a flake channel for conducting wood flakes from the associated knife to an under surface of the disk;

b. a shroud disposed over said disk including guide means beneath the disk to conduct away wood flakes produced by said cutting disk;

c. a drive motor for said disk mounted beneath said disk and an associated drive connecting the motor to the vertical axis of said disk; and

d. at least a pair of continuous feed conveyors for supplying logs previously cut to a predetermined length to the upper side of said cutting disk with the logs being oriented generally along a radius of the disk, each of the continuous feed conveyors having a vertical feed chute that is open at its bottom through said shroud and a conveyor for bringing the logs in the proper orientation into a top of said chute, such that the logs form a vertical stack in said chute with the logs at the bottom of the stack contacting said cutting disk.

4,964,448

RAISED PANEL CUTTER ASSEMBLY

David A. Schultz, R. D. 5, Box 59, Balatie, N.Y. 12184

Filed Sep. 14, 1958, Ser. No. 407,175
Int. Cl.[5] B27G *13/12*
U.S. Cl. 144—223 **3 Claims**

1. A cutter assembly for forming a raised panel having a generally sloping perimeter, comprising

(a) a cutter body having

(1) a center hub portion extending longitudinally through the cutter body,

(2) wings of a certain number extending generally radially outward from the hub portion and having a height parallel to the longitudinally extending hub portion,

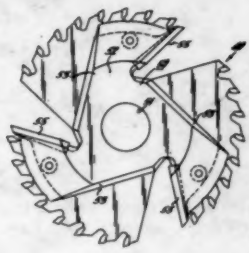
(3) said wings decreasing in height radially outward from the hub portion, and

(b) a circular saw blade secured to the cutter body, having

(1) a web portion,

(2) a plurality of teeth on the perimeter of the web, and

(3) a plurality of gullets conforming to the cutter wing



locations, whereby evacuation spaces are provided for the cutter wings,

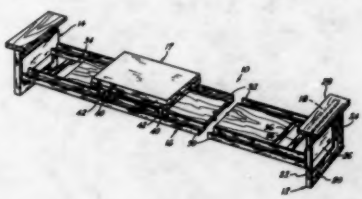
the number of teeth on the saw blade being substantially greater than the number of wings on the cutter.

4,964,449

MITER SAW TRACK

John M. Conners, 2741 NW. 22, Oklahoma City, Okla. 73107

Filed Mar. 27, 1990, Ser. No. 499,748
Int. Cl.[5] B25H *1/00*
U.S. Cl. 144—286 R **3 Claims**



1. An elongated workpiece support, comprising:

a pair of spaced-apart upright parallel frames;

a workpiece rest horizontally supported by the upper limit of each frame of said pair of frames;

tracks extending between and horizontally supported by said pair of frames;

carriage means supported by said tracks for reciprocable movement between said frames; and,

a workpiece processing tool means supported by said carriage means for processing a workpiece when extending between and supported by said workpiece rests.

4,964,450

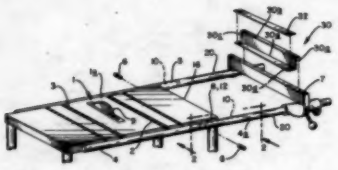
EXTENSION FOR TABLE SAW

James D. Hughes, P.O. Box 335, and Bryan K. Bailey, Rte. 1, both of Brownsboro, Tex. 75756

Filed Dec. 15, 1989, Ser. No. 415,101
Int. Cl.[5] B27C *9/02*
U.S. Cl. 144—287 **4 Claims**

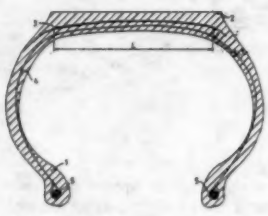
1. A table extension for extending a table on a table saw having guide rails and a moveable fence comprising: adapter means connected to the existing guide rails of the table saw; extender arms having the cross sectional configuration the same as the guide rail; means connecting the extension arm and the adapter means to axially align the guide rails and the exten-

der arm to extend the length of the guide rail on the table saw; and a material support means having a horizontal surface the



same height as the table of the saw being adapted to slide over the existing fence so as to support the of the material being cut.

4,964,451
PNEUMATIC TIRE
Oskar Schmidt, Freyung 4, 1010 Vienna, Austria
Filed Dec. 1, 1988, Ser. No. 278,680
Claims priority, application Austria, Dec. 2, 1987, 3177/87
Int. Cl.[5] B60C *7/22, 5/00*
U.S. Cl. 152—202 **7 Claims**



1. A belted vehicle tire comprising:
an elastomeric body provided with:
a tread portion formed with a flattened outer circumference and a generally flattened inner circumference spaced from said outer circumference, and
a pair of spaced apart curved side walls connected to said tread portion and each having a respective radial inner surface merging with said inner circumference of said tread portion, and terminating remote from said tread at a bead;
a radial reinforcement extending continuously through said tread portion and said side walls of said body and being spaced from said inner circumference of said tread portion;
means for fastening said radial reinforcement at said bead; and
a belt extending generally parallel to said flattened outer circumference endlessly along the entire tread portion through said tread portion of said elastomeric body, said belt being located between said radial reinforcement and said outer flattened circumference of said tread portion, said belt being formed by a plurality of links positioned side by side and each link formed by at least one helical wire having mutually parallel axes extending transversely to a circumferential direction of said elastomeric body, each of said helical wires having flattened turns with opposite bends, each of said links being directly looped at said bends to respective bends of the adjacent links.

4,964,452
PNEUMATIC TIRES
Danny E. Harrison, 11982 Shoshone Ave., NW, Uniontown, Ohio 44685, and Joseph Zekoski, 2788 Laurel Woods Blvd., Stow, Ohio 44224
Continuation of Ser. No. 111,249, Oct. 22, 1987, abandoned.
This application Feb. 13, 1989, Ser. No. 309,940
Int. Cl.[5] B60C *15/00*
U.S. Cl. 152—554 **15 Claims**

1. A tubeless pneumatic tire comprising:
(a) a pair of axially spaced apart annular bead cores;
(b) a single carcass ply of side-by-side steel cables, said carcass ply comprising a central portion and a pair of turn-up portions, each of said bead cores having one of said turn-up portions folded axially and radially outwardly thereabout, each said turn-up portion including a lateral edge of the carcass ply with said lateral edges disposed radially outwardly of the nominal bead diameter of the tire a radially measured distance in the range of 5% to 25% of the section height of the tire, the steel cables of the carcass ply intersecting a mid-circumferential plane of the tire at angles in the range of 75° to 90 ° with respect to said mid-circumferential plane;
(c) an annular elastomeric apex member inter posed between each said turn-up portion and the central portion of the carcass ply;
(d) a chafer strip on the side of carcass ply distal from the bead core; and
(e) each turn-up portion of the carcass ply having a pair of annular stiffening members associated therewith, the first stiffening member being interposed between said elastomeric apex member and said turn-up portion of the carcass ply and the second stiffening member being disposed entirely radially outwardly of the chafer and axially outwardly of and adjacent to the turn-up portion of the carcass ply, each of the stiffening members having a radially innermost edge which is disposed radially inwardly of the associated lateral edge of the carcass ply a radially measured distance in the range of 5 mm to 35 mm with each of the stiffening members being entirely located axially outwardly of the axially outermost extent of the associated bead core, each said stiffening member having a radially outermost edge which is disposed radially outwardly of the associated lateral edge of the carcass ply a radially measured distance in the range of 5 mm to 35 mm, each said stiffening member comprising side-bu-side nylon cords oriented in the range of 25° to 35° with respect to a circumferential line of the tire, the cords of said first and second stiffening members being oriented in opposite manners with respect to said circumferential line of the tire.

7. A tube-type pneumatic tire comprising:
(a) a pair of axially spaced apart annular bead cores;
(b) a single carcass ply of side-by-side steel cables, said carcass ply comprising a central portion and a pair of turn-up portions folded axially and radially outwardly thereabout, each said turn-up portion including a lateral edge of the carcass ply with said lateral edges disposed radially outwardly of the nominal bead diameter of the tire a radially measured distance in the range of 10% to 30% of the section height of the tire, the steel cables of the carcass ply intersecting a mid-circumferential plane of the

tire at angles in the range of 75° to 90 ° with respect to said mid-circumferential plane;

(c) an annular elastomeric apex member interposed between each of said turn-up portions and the central portion of the carcass ply;

(d) a chafer strip on the side of the carcass ply distal from the bead core; and

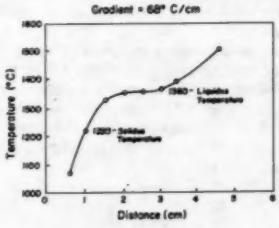
(e) each turn-up portion of the carcass ply having a pair of annular stiffening members associated therewith, the first stiffening member being interposed between said elastomeric apex member and said turn-up portion of the carcass ply and the second stiffening member being disposed entirely radially outwardly of the chafer and axially outwardly of and adjacent to the turn-up portion of the carcass ply, each of the stiffening members having a radially innermost edge which is disposed radially inwardly of the associated lateral edge of the carcass ply a radially measured distance in the range of 5 mm to 35 mm with the entire stiffening member being disposed axially outwardly of the axially outermost extend of the associated bead core, each said stiffening member having a radially outermost edge which is disposed radially outwardly of the associated lateral edge of the carcass ply a radially measured distance in the range of 5 mm to 35 mm, each said stiffening member comprising side-by-side nylon cords oriented in the range of 25° to 35° with respect to a circumferential line of the tire, the cords of said first and second stiffening members being oriented in opposite manners with respect to said circumferential line of the tire.

4,964,453

DIRECTIONAL SOLIDIFICATION OF SUPERALLOYS

Deborah D. Schmidt, Huntsville, Ala.; Wendy S. Alter, Bow, Wash., and William D. Hamilton, Huntsville, Ala., assignors to The United States as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 7, 1989, Ser. No. 404,289
Int. Cl.[5] B22D *27/04*
U.S. Cl. 164—122.1 **7 Claims**



1. A process for the controlled directional solidification of a superalloy melt utilizing a temperature cooling profile having a plurality of slopes comprising the following steps:

(a) cooling the melt from a temperature above its liquidus temperature to its liquidus temperature;

(b) maintaining the melt at or near its liquidus temperature for a predetermined period of time sufficient to eliminate or suppress eutectic formations; and

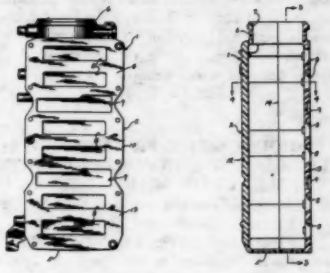
(c) cooling then changing and increasing the slope of the temperature profile to quickly increase the cooling rate until the solidus temperature of the alloy is reached.

4,964,454

EVAPORABLE FOAM PATTERN FOR CASTING AN AIR INDUCTION MANIFOLD

James C. Hubbell, Fond du Lac; Gordon L. Stiller, Omro, and David D. Liegeois, Oshkosh, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Dec. 7, 1988, Ser. No. 281,187
Int. Cl.[5] B22C *7/02*
U.S. Cl. 164—246 **8 Claims**



1. An evaporable foam pattern for casting a metal air induction manifold for an internal combustion engine, the assembled pattern comprising an elongated hollow body member formed of an evaporable foam material, said body member including a side wall and having an end wall enclosing one end of said side wall, the opposite end of said body member having an opening, said side wall including a plurality of slots extending therethrough, said pattern being composed of two longitudinal sections having abutting edges disposed along a longitudinal parting line, said parting line extending through said end wall and through said opposite open end, all of said slots being disposed in one of said pattern sections, and means for joining said abutting edges.

4,964,455

METHOD OF MAKING THIXOTROPIC METAL PRODUCTS BY CONTINUOUS CASTING

Jean-Luc Meyer, Voiron, France, assignor to Aluminum Pechiney, Paris, France

Filed Jun. 6, 1989, Ser. No. 362,317
Claims priority, application France, Jul. 7, 1988, 88 09616
Int. Cl.[5] B22D *27/02*
U.S. Cl. 164—468 **23 Claims**

1. A method of making thixotropic metal products by continuous casting, comprising:

pouring liquid metal into a continuous casting mold including an upstream portion having a wall made of heat insulating material at least on its inner surface to form a hot zone, a downstream portion having a well made at least

partially of a heat conducting material to form a cold zone, and a movable end at one extremity;

cooling the outer surface of the downstream portion with a heat exchanging fluid, thereby causing the formation of crystals in the liquid metal by solidification in the cold zone, and causing the formation of a solid crust of metal on contact with the inner surface of the downstream portion;

moving the movable end so as to extract metal product supported by said crust from the mold; and

causing circulation of liquid metal within the mold in a cycle from the cold zone to the hot zone and back to the cold zone to cause said crystals to remelt at the surface and promote the degeneration of dendrites, the period of transfer between zones being ≦1 second.

4,964,456

CONTINUOUS CASTING PROCESS AND MACHINE WITH AT LEAST ONE TRAVELLING CASTING BELT FOR THE PRODUCTION OF METAL STRIPS AND RODS

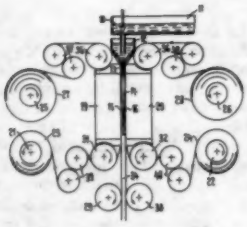
Wilhelm F. Lauener, Geriafingen, Fed. Rep. of Germany, assignor to Larex AG, Recherswil, Switzerland

Filed Jan. 3, 1989, Ser. No. 293,064

Claims priority, application Switzerland, Jan. 28, 1988, 0297/88

Int. Cl.[5] B22D *11/06*

U.S. Cl. 164—481 **16 Claims**



1. A process for the continuous casting of metal strips or rods comprising:

unwinding a dispensing means containing an open ended travelling casting belt having a cross-section and an elasticity;

feeding said belt into a casting region;

forming a mold for producing metal strips or rods with said belt in said casting region;

passing said belt out of said casting region; and

recoiling said belt onto a take-up means,

whereby said belt is irreversibly stretched by a tension greater than the elasticity of said belt, the tension caused by the interaction of said dispensing means and said take-up means, the tension being in a direction along said belt's path of motion, so that a contraction of said belt's cross-section occurs, thereby preventing warping or buckling of said belt while it moves along the casting region.

4,964,457

UNIDIRECTIONAL HEAT PIPE AND WICK

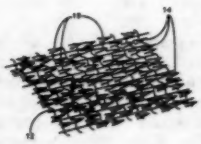
John F. Leonard, Beavercreek, and Brian G. Hager, Kettering, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 24, 1988, Ser. No. 261,808

Int. Cl.[5] F28D *15/02*

U.S. Cl. 165—32 **2 Claims**

1. A wick, comprising particles sintered together, over a substrate, in the shape of a plurality of overlapping laid down points, each point comprising a plurality of particles and having a base and an apex, wherein the points are aligned at acute angles to the substrate with their bases substantially attached to



the substrate and their apexes all pointing substantially in the same direction.

4,964,458

FLEXIBLE FINNED HEAT EXCHANGER

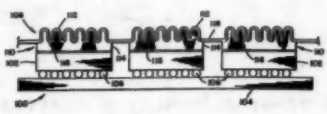
Ephraim B. Flint, Garrison; Kurt R. Grebe, Beacon; Peter A. Gruber, Mohegan Lake, and Arthur R. Zingher, White Plains, all of N.Y., assignors to International Business Machines Corporation

Continuation-in-part of Ser. No. 858,318, Apr. 30, 1986, Pat. No. 4,730,666. This application Feb. 29, 1988, Ser. No. 161,880

Claims priority, application Japan, Jan. 20, 1987, 62-9218; European Pat. Off., Apr. 1, 1987, 871048096

Int. Cl.[5] F24C *1/04*

U.S. Cl. 165—80.4 **3 Claims**



1. A heat exchanger for transferring heat from an array of electric circuit chips to a fluid coolant comprising:

a flexible sheet of thermally conductive material sufficiently large to cover the array of chips and sufficiently flexible to conform to individual orientations of the chips to make thermal contact therewith; and

a set of thermally conductive fin assemblies extending normally from said sheet, said fin assemblies having fins directed for contacting a coolant for extraction of heat therefrom; and

wherein said fin assemblies are thermally connected to said chips; and said sheet contacts said fin assemblies on fin surfaces of each said fin assembly opposite a connection of said sheet with said circuit chip, said sheet having undulations for flexible compliance with the surface of the fins for interaction with the coolant for extraction of heat from said fin assemblies.

4,964,459

HEAT EXCHANGER

Stig Stenlund, Bataljvägen, Sweden, assignor to Hypeco AB, Malmo, Sweden

PCT No. PCT/SE88/00070, § 371 Date Jul. 28, 1988, § 102(e) Date Jul. 28, 1988, PCT Pub. No. WO88/06707, PCT Pub. Date Sep. 7, 1988

PCT Filed Feb. 18, 1988, Ser. No. 224,945

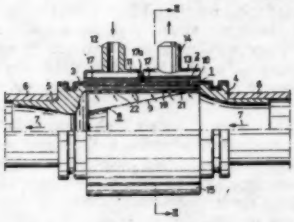
Claims priority, application Sweden, Feb. 24, 1987, 8700773

Int. Cl.[5] F28D *7/10*; F28F *1/42*

U.S. Cl. 165—119 **7 Claims**

4. A heat exchange for effecting exchanger of heat between a first liquid medium and a second liquid medium, comprising a tubular structure with a substantially circular cross-section, a liquid impervious wall and open axial ends forming an inlet and

an outlet respectively for said first medium and forming a continuous and permanently open flow path for a main flow of said first medium form said inlet end to said outlet end; a first heat-exchange chamber with an annular substantially circular cross-section coaxially encircling said main flow path of said tubular structure; and a second heat-exchange chamber with an annular substantially circular cross-section encircling coaxially said first heat-exchange chamber; said first and second heat-exchange chambers being separated from one another in a liquid-tight fashion by a common liquid-impervious partition wall forming part of the liquid-impervious wall of said tubular structure; said second heat-exchange chamber having an inlet and an outlet for a flow of said second medium; said first heat-exchange chamber having at least one inlet opening and at least one outlet opening communicating with said main flow



path of said tubular structure with the inlet opening located upstream of the outlet opening with respect to the flow in said main flow path; and said main flow path of said tubular structure having means creating at said inlet opening of said first heat-exchange chamber a local static pressure which is higher than the static pressure at the axial inlet end of said tubular structure and means creating at said outlet opening of said first heat-exchange chamber a local static pressure which is lower than the static pressure at the axial outlet end of said tubular structure so that the pressure difference between said inlet opening and said outlet opening of said first heat-exchange chamber is larger than the pressure difference between the axial inlet end and the axial outlet end of said tubular structure and so that a part of said main flow is diverted to flow through said first heat-exchange chamber via said inlet and outlet openings thereof.

4,964,460

SHUT-IN TOOL

Richard A. Armell, and David Coull, both of Montrose, Scotland, assignors to Eljay Well Services Limited, Dundee, Scotland

PCT No. PCT/GB89/00036, § 371 Date Sep. 15, 1989, § 102(e) Date Sep. 15, 1989, PCT Pub. No. WO89/06740, PCT Pub. Date Jul. 27, 1989

PCT Filed Jan. 16, 1989, Ser. No. 401,454

Claims priority, application United Kingdom, Jan. 15, 1988, 8800875

Int. Cl.[5] **E21B** *34/14, 47/06, 49/00, 23/00*

U.S. Cl. 166—113 **20 Claims**

1. A shut-in tool for cooperation with a ported landing nipple disposed below a packer in a tubing string of an oil or gas well, the ported landing nipple defining upper and lower interior seal bores above and below ports thereof, said tool comprising

a locking mandrel for cooperation with the landing nipple,

a mandrel core which is axially movable relative to the locking mandrel and comprises upper and lower portions, the lower portion being surrounded by the locking mandrel, and said mandrel core defining a through passage extending along at least part of the length of the core,

jay slot means comprising a pattern of grooves and at least one pin engageable therein, the pattern being defined on the lower portion of the core or in a cooperating surface of the locking mandrel and the pin or pins being carried by other of these parts,

said pattern of grooves being such that, in response to axial movement of the core relative to the locking mandrel, the lower portion of the core is guided rotationally and axially by engagement of the pin or pins with the grooves in order to cycle the tool between a flow position and a shut-in position,

said upper portion of the mandrel core including

a packing assembly sealingly engageable with said upper and lower interior seal bores of the landing nipple when the tool is in the shut-in and flow positions respectively,

coupling means for receiving a test gauge such that the gauge will be in communication, via the through passage, with the pressure in the tubing string below the packing assembly when the tool is in the shut-in position,

an equalizing valve assembly moveable between a closed position in which fluid communication between the through passage and the interior of the tubing string above the packing assembly is prevented, and an open position in which such fluid communication is allowed, and

means for connecting the tool to a wireline.

4,964,461

PROGRAMMED GELATION OF POLYMERS USING MELAMINE RESINS

Paul Shu, West Windson, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Nov. 3, 1989, Ser. No. 431,419

Int. Cl.[5] **E21B** *33/138, 43/22, 43/24*

U.S. Cl. 166—252 **10 Claims**

1. A process for enhancing the amount of oil recovered from a subterranean oil-bearing formation having relatively high permeability zones and relatively low permeability zones penetrated by at least one injection well and at least one production well by selectively plugging at least a portion of the relatively high permeability zones with a profile control gel, comprising the steps of:

(a) determining a quantity of a gel-forming mixture required for the selective plugging of at least a portion of the relatively high permeability zones within the formation and the period of time within which full gelation of the mixture is to be completed;

(b) preparing a gel-forming mixture comprising a polymer which is crosslinkable by reaction with an amino resin, a rapid amino resin crosslinking agent and a delayed amino resin crosslinking agent, said gel-forming mixture capable of complete gelation within the period of time determined in step (a);

(c) partially gelling the mixture to impart selectivity to the mixture by reacting the polymer with the rapid amino resin crosslinking agent which is effective to complete the

partial gelation by crosslinking the polymer to form a viscous liquid;

(d) injecting the viscous liquid into the relatively high permeability zones within the formation;

(e) fully gelling the viscous liquid by reacting the polymer with the delayed amino resin crosslinking agent which is effective to complete the full gelation by crosslinking the polymer within the period of time determined in step (a);

(f) injecting a flooding fluid into the relatively low permeability zones of the formation via the injection well; and

(g) recovering fluids including oil from the formation via the production well.

4,964,462

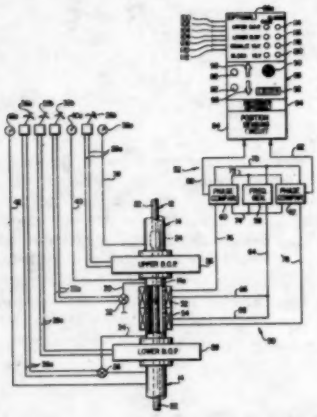
TUBING COLLAR POSITION SENSING APPARATUS, AND ASSOCIATED METHODS, FOR USE WITH A SNUBBING UNIT

Michael L. Smith, P.O. Box 249 (County Rd. 38), Banquete, Tex. 78339

Filed Aug. 9, 1989, Ser. No. 391,488

Int. Cl.[5] E21B *47/09*; G01B *7/00*; G01V *3/26*

U.S. Cl. 166—255 **24 Claims**



16. A method of detecting the entry of a tubing string joint connecting collar into a longitudinal section of a riser spool disposed between upper and lower blowout preventers during axial tubing string movement through the riser spool, said method comprising the steps of:

securing an electric induction coil to the longitudinal riser spool section between the upper and lower blowout preventers;

supplying electrical power to said electric induction coil;

causing the tubing collar, as it enters said longitudinal riser spool section, to create a phase shift in said electrical power; and

detecting said phase shift and responsively generating an output signal indicative thereof.

18. Apparatus for sensing the entry, into a predetermined longitudinal section of a pipe extending downwardly into a well bore, of a tubing collar portion of an elongated tubing string being axially moved through the interior of said pipe, said apparatus comprising:

electric induction coil means outwardly circumscribing said longitudinal section of said pipe;

circuit means for supplying electrical power to said electric induction coil means at a predetermined frequency, detecting variations in the supplied electrical power attributable to variations in the longitudinal position of said collar portion relative to said longitudinal section of the pipe, and responsively generating output signal means indicative of the entry of said collar portion into said longitudinal section of the pipe; and

isolating means for isolating the pipe interior above said section of pipe from the well bore pressure while permitting the axial passage of the tubing string through said section of pipe.

4,964,463

CROSSLINKED POLYVINYL AMINE COPOLYMER GELS FOR USE UNDER HARSH RESERVOIR CONDITIONS

Paul Shu, Cranbury, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Oct. 16, 1989, Ser. No. 422,199

Int. Cl.[5] E21B *33/138*, *43/22*, *43/24*

U.S. Cl. 166—270 **10 Claims**

1. A process for recovering oil from a subterranean oil-bearing formation having relatively high permeability zones and relatively low permeability zones penetrated by an injection well and at least one production well in fluid communication with a substantial portion of the formation, comprising the steps of:

(a) injecting into the relatively high permeability zones of the formation via the injection well an aqueous gel-forming composition comprising water, a viscosifying amount of a water-dispersible polyvinyl amine copolymer; and a crosslinking agent which is a mixture of a phenolic component and an aldehyde, said crosslinking agent present in an amount effective to cause gelation of said polyvinyl amine copolymer;

(b) injecting a flooding fluid into the formation via the injection well that preferentially enters the low permeability zones; and

(c) recovering fluids including oil from the formation via the production well.

4,964,464

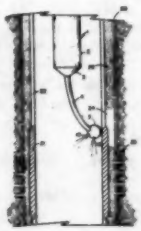
ANTI-SAND BRIDGE TOOL AND METHOD FOR DISLODGING SAND BRIDGES

Larry G. Myers, Ennis, Tex., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Oct. 31, 1989, Ser. No. 429,518

Int. Cl.[5] E21B *37/08*

U.S. Cl. 166—278 **19 Claims**



1. An anti-sand bridge tool for dislodging a sand bridge located between a linear wall and a casing wall of a gravel packed well completion, comprising:

(a) a tubular sub pipe having a first end and a second end, said first end having means for connecting said tubular sub pipe to a tubular work string;

(b) a hollow flexible member for delivering a fluid at high pressure having a first end and a second end, said first end of said flexible member adapted for attachment to said second end of said tubular sub pipe; and

(c) a striking means having a fluid inlet orifice and at least two fluid exit orifices, said fluid inlet orifice connected to and in fluid communication with said second end of said flexible member; whereby initiation on fluid flow through the tool effects an arcuate movment of said striking means resulting in said striking means contacting the liner wall in a manner effective to dislodge a sand bridge.

10. A method for dislodging a sand bridge between a liner wall and a causing wall of a gravel packed well completion, comprising the steps of: (a) locating a sand bridge within the gravel packed well completion; (b) positioning an anti-sand bridge tool within the well bore substantially adjacent to the sand bridge, the tool comprising: a tubular sub pipe having a first end and a second end, the first end having means for connecting the tubular sub pipe to a tubular work string; a hollow flexible member for delivering a fluid at high pressure having a first end and a second end, the first end of the flexible member adapted for attachment to the second end of the tubular sub pipe; and a striking means having a fluid inlet orifice and at least one fluid exit orifice, the fluid inlet orifice connected to and in fluid communication with the second end of the flexible member; and (c) cycling a flow of fluid on and off so that initiation of fluid flow through the tool effects an arcuate movement of the striking means resulting in the striking means contacting the liner wall in a manner effective to dislodge a sand bridge.

4,964,465

METHOD EMPLOYING LIQUIDIZED SAND FOR CONTROLLING LOST CIRCULATION OF DRILLING FLUIDS

Billy W. Surles, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 6, 1989, Ser. No. 432,011
Int. Cl.[5] E21B *33/138*; E02D *3/12*
U.S. Cl. 166—295 **6 Claims**

1. A method of reducing lost circulation of drilling fluids in a wellbore penetrating an underground formation, comprising:

preparing a liquidized sand by mixing a resin-coated particulate material with an aqueous carrier fluid comprising a surfactant;

injecting said liquidized sand into a wellbore;

causing said liquidized sand to settle into an area of lost circulation; and

allowing said liquidized sand to solidify in said area of lost circulation.

4,964,466

HYDRAULIC FRACTURING WITH CHLORINE DIOXIDE CLEANUP

Dennis A. Williams, Houston; John C. Newlove, and Roger L. Horton, both of Kingwood, all of Tex., assignors to Exxon Chemicals Patents Inc, Linden, N.J.

Filed Aug. 7, 1989, Ser. No. 390,213
Int. Cl.[5] E21B *43/27*
U.S. Cl. 166—300 **10 Claims**

1. A method for fracturing a subterranean formation penetrated by a wellbore which comprises

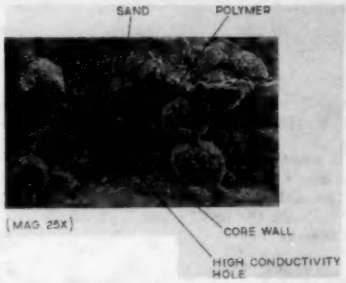
(a) injecting a fracturing fluid into the formation to form a vertical fracture therein, the fracturing fluid being gelled with a polymer selected from guar, guar derivatives, acrylamide, acrylamide derivatives, cellulose, cellulose derivatives, and mixtures thereof and crosslinked with an organometallic crosslinking compound and having temperature stability above about 175° F.;

(b) packing the fracture with particulate propping agent;

(c) backflowing fluids from the formation through the propped fracture to remove a portion of the polymer;

(d) injecting at matrix rates sufficient aqueous solution of chlorine dioxide down the wellbore and into the propped fracture to penetrate at least 60 feet of the propped fracture length and contact polymer in the fracturing fluid and polymer residue in the propped fracture and on the fracture walls, the amount of the chlorine dioxide in the aqueous medium being sufficient to degrade polymer in the fracturing fluid and polymer residue;

(e) permitting the chlorine dioxide to remain in contact with the polymer in the fracturing fluid and with the polymer residue on the fracture walls and in the fracture for sufficient time to degrade the polymer thereby reducing the fracturing fluid viscosity and dissolving portions of the polymer residue; and



(f) flowing formation fluid from the formation through the propped fracture and into the wellbore to remove substantial portions of the polymer and degraded polymer from the fracture.

4,964,467

NON-AQUEOUS VISCOSIFIED CARBON DIOXIDE AND METHOD OF USE

Marlin D. Holtmyer, and Charles V. Hunt, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 6, 1989, Ser. No. 417,941
Int. Cl.[5] E21B *43/26*
U.S. Cl. 166—308 **23 Claims**

1. A method of treating a subterranean formation penetrated by a well bore comprising:

solubilizing a polymer comprising N,N-dimethylacrylamide in a substantially anhydrous fluid to form a viscosified fluid;

admixing said viscosified fluid with liquid carbon dioxide to form an admixture in which said carbon dioxide is present in an amount sufficient to comprise from about 0% to about 80% by volume of said admixture;

introducing said admixture into said well bore; and

treating said subterranean formation with said admixture.

4,964,468

METHOD OF INHIBITING CORROSION

William L. Adams, and Gary R. Chesnut, both of Houston, Tex., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Aug. 8, 1989, Ser. No. 390,755
Int. Cl.[5] E21B *41/02*
U.S. Cl. 166—310 **12 Claims**

1. A process for inhibiting corrosion in an oil or gas well comprising:

introducing into said well a corrosion inhibitor composition comprised of

a water external emulsion comprised of a water medium, a corrosion inhibitor formulation, and a surfactant,

wherein said surfactant has an HLB of from about 10 to about 17 and is present in said emulsion in the amount of from about 1.0 to about 4.5 parts by weight per 100 parts by weight of said corrosion inhibitor formulation,

wherein said corrosion inhibitor formulation is comprised of from about 20 to about 100 weight percent of at least one corrosion inhibitor compound of the oil soluble organic film forming type, the remainder of said corrosion inhibitor formulation being an organic diluent for said corrosion inhibitor compound, and

wherein said water external emulsion is in a temporary stable state when introduced into said well, said temporary stable state being that in which upon standing without agitation at room temperature a separation of 50 percent by volume of said corrosion inhibitor formulation occurs within the time period of from 2 to 30 minutes.

4,964,469

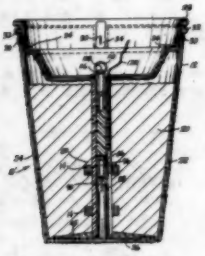
DEVICE FOR BROADCASTING DRY MATERIAL BY EXPLOSIVE FORCE

Wayne D. Smith, 6017 122nd SW., Tacoma, Wash. 98063

Continuation of Ser. No. 195,213, May 18, 1988, abandoned. This application Feb. 21, 1990, Ser. No. 483,319

Int. Cl.[5] A62C *19/00, 3/02, 35/08*

U.S. Cl. 169—28 **32 Claims**



1. A dry material broadcast device, comprising:

a frangible rigid-wall container;

an explosive charge within said container;

a removable impact-activated detonator including an explosive portion;

a fuse cord operably positioned between said explosive portion of said detonator and said explosive charge; and

dry payload material within said container and substantially surrounding said explosive charge,

said detonator in operation being located within said container and said explosive portion of said detonator being readily removable from said container without substantial disassembly of said container to thereby disarm said device by physical separation of the explosive portion and said explosive charge.

4,964,470

SPRINKLER CONNECTION TO SCRUBBER DUCT

Donald Gaulin, Lunenberg, Mass., assignor to McDonald Plumbing & Heating Inc., Mass.

Filed Nov. 10, 1988, Ser. No. 269,730

Int. Cl.[5] A62C *37/30*

U.S. Cl. 169—56 **20 Claims**

1. A sprinkler connection to a scrubber duct of the kind carrying noxious and inflammable gases comprising:

(a) a scrubber duct;

(b) a single entry port of circular cross section provided in said duct;

(c) a sprinkler head enclosed within a shroud and designed to be inserted via said port into said duct;

(d) means for removably mounting said sprinkler head and said shroud within said duct; and

(e) a flexible hose for connecting said sprinkler head to a source of fluid supply.

4,964,471

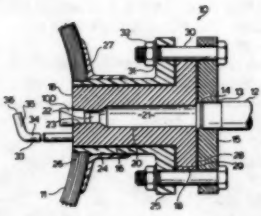
SPRINKLER SYSTEM AND SPRINKLER ASSEMBLY THEREFOR

Leo K. Michalik, Fruitvale, and Segio G. Mussio, Trail, both of Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Sep. 1, 1989, Ser. No. 401,882

Int. Cl.[5] A62C *37/11, 37/08*

U.S. Cl. 169—57 **6 Claims**



1. A fire suppression system for ducts carrying flows of corrosive gases, said system comprising at least one pipe for conducting extinguishing fluid, said ducts each having a wall with an inner wall surface and at least one nozzle mounted perpendicularly to said wall with one end in said wall, said at least one nozzle having an integral nozzle flange at the other end; an adapter slideably inserted in said at least one nozzle, said adapter having an adapter face at one end, an integral adapter flange at the opposite end and a central adapter passage having a threaded portion in proximity to said adapter face, said adapter face being substantially flush with said inner wall surface of said ducts; a pipe flange with a central opening connected to said at least one fluid pipe; said integral adapter flange being rigidly clamped between said nozzle flange and said pipe flange; a sprinkler head screwed into said threaded portion of said central adapter passage such that a portion of said sprinkler head protrudes from said passage, the protruding portion being exposed to said flows of corrosive gases, said sprinkler head having a central sprinkler head passage containing a seal plug at one end, a fusible fill at the opposite end at said protruding portion and a piston between said seal plug and said fusible fill; said at least one fluid pipe, said central adapter passage and said central sprinkler head passage forming a continuous clean passage for conducting extinguishing fluid when upon activation of said system by melting of said fusible fill, fluid pressure cleanly ejects said piston and said seal plug from said central sprinkler head passage; and said adapter and

said piston forming an effective barrier against heat transfer and preventing any cooling effect to reach said fusible fill.

4,964,472

WEED REMOVER

Marianne Cleworth, 455 Poppy Hill Rd., Watsonville (Corralitos), Calif. 95076

Continuation-in-part of Ser. No. 307,542, Mar. 23, 1989, abandoned. This application Jan. 3, 1990, Ser. No. 462,887

Int. Cl.[5] A01B 1/16

U.S. Cl. 171—11 **14 Claims**

1. A weed removing apparatus for completely removing landscaping weeds without its user having to touch the soil or weeds, said apparatus comprising:

a frame having a handle at one end and a digging blade at an opposing end,

a foot bar extending from said frame,

a means for generating a vacuum force through a vacuum input tube secured to said frame, and having vacuum blower means for depositing severed weeds into a weed collecting housing having a weed disposal bag therein,

an outlet hose for discharge of air flow exhaust from said blower,

means attached to said frame for storage and controlled release of weed killer or other fluid to the root area of said weed, and

a strap attached to said frame for carrying and positioning the weed removing apparatus.

4,964,473

METHOD FOR DRIVING A HYDRAULIC SUBMERGED TOOL

Dik Arentsen, Leiderdorp, Netherlands, assignor to IHC Holland N.V., Sliedrecht, Netherlands

Filed Mar. 14, 1989, Ser. No. 322,835

Claims priority, application Netherlands, Mar. 15, 1988, 8800632

Int. Cl.[5] E02D 7/10

U.S. Cl. 173—1 **11 Claims**

1. A method for driving a hydraulic tool submerged in surrounding water comprising:

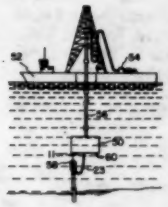
providing one or more work cylinders, each of said cylinders being divided by a floating piston into a first and second space;

filling said first space with pressurized surrounding water;

filling said second space with a hydraulic work medium;

reciprocating said floating piston in said work cylinder;

alternately connecting said first space to one of a feed conduct for pressurized water and a free exhaust each time said floating piston reaches the end of its work stroke;



operatively connecting said second space to the tool through a pressure conduct; and

driving the tool with said hydraulic work medium.

4,964,474

FLEXIBLE TUNNELING APPARATUS AND METHOD

William L. Poesch, 12213 Folkstone Dr., Herndon, Va. 22071

Filed Jun. 22, 1989, Ser. No. 370,221

Int. Cl.[5] E21B 7/08

U.S. Cl. 175—74 **14 Claims**

1. In combination with apparatus for boring a primary shaft, an elongate articulated thrust rod for boring a secondary passage intersecting said shaft at substantially right angles at a subterranean location, said rod comprising:

(a) a plurality of substantially identical, generally tubular elements having complementary bearing surfaces at their respective ends, said elements, when in operative correlation, being disposed with said bearing surfaces in contact;

(b) a cable strung through said plurality of elements; and

(c) means for securing said cable to the respective endmost elements and exerting a tensile force on said cable, the magnitude of said force being such as to maintain said elements in normally rigid coaxial relation to form the articulated rod while permitting flexure of the rod in response to an applied lateral force of sufficient magnitude.

4,964,475

DRILLING DEVICE FOR PRODUCING DRILL HOLES WITH UNDERCUT

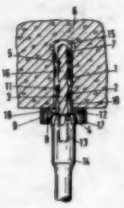
Arthur Fischer, Waldachtal/Tumlingen, Fed. Rep. of Germany, assignor to fischerwerke Artur Fischer GmbH & Co KG, Waldachtal/Tumlingen, Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 300,058

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1988, 3802421; Jun. 9, 1988, 3819650

Int. Cl.[5] E21B *17/10, 7/28;* E21C *9/00*

U.S. Cl. 175—210 **11 Claims**



1. A drilling device for producing in a single drilling operation a drill hole having an undercut at its end, comprising a drill shaft (1) of a uniform diameter; a drill plate (5) attached to one end of the drill shaft and having a dimension which exceeds the diameter of the drill shaft; a shoulder (4) provided at the other end of the drill shaft; drill shaft guiding means including a guide sleeve having an upper guide sleeve portion (8) surrounding the drill shaft above the drill hole, a lower guide sleeve portion (2) surrounding the drill shaft within the drill hole, and an annular flange (18) formed on the upper guide sleeve portion to abut at one side thereof against a surface around the drill hole and to engaged the shoulder at the opposite side thereof; the upper guide sleeve portion having a larger inner diameter than the diameter of the shoulder; the lower guide sleeve portion having a uniform outer diameter which substantially corresponds to the diameter of the drill hole, the lower sleeve portion defining two opposite open ends of different inner diameters, and a conical inner surface extending between the two open ends the entire length of the lower guide sleeve portion, one of the open ends having an inner diameter to guide the shaft during straight drilling and to act as a pivot point for the drill shaft when the shoulder abuts against the flange and an undercut is being formed, and the inner diameter of the other open end being larger than the inner diameter of the one open end to permit pivotal movement of the drill shaft during the formation of the undercut.

4,964,476

DRILLING DEVICE FOR PRODUCING DRILL HOLES WITH AN UNDERCUT

Artur Fischer, Tumlingen, Fed. Rep. of Germany, assignor to fischerwerke Artur Fischer GmbH & Co. KG, Waldachtal/-Tumlingen, Fed. Rep. of Germany

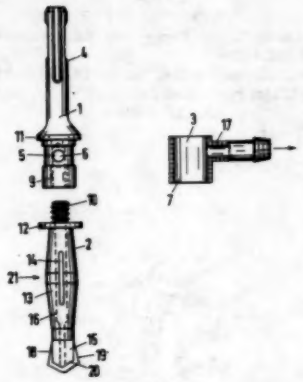
Filed Oct. 13, 1989, Ser. No. 421,527

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1988, 3835025

Int. Cl.[5] E21B *10/26*

U.S. Cl. 175—213 **7 Claims**

1. A drilling device for producing drill holes with an undercut, comprising a drill bit having a stem, a drill head arranged at an end of said stem, and a drill plate projecting from said drill head; a drill bit holder for receiving said drill bit and having a suction chamber; and a suction bell surrounding said drill bit holder and communicating with said suction chamber, said drill bit stem having a continuous axial bore communicating with said suction chamber, a cross-section enlargement for pivotally supporting said drill bit during forming an undercut, a tapering surface extending from said cross-sectional enlargement for limiting a size of the undercut, and a plurality of slots



provided on said stem in a region of said cross-sectional enlargement.

4,964,477

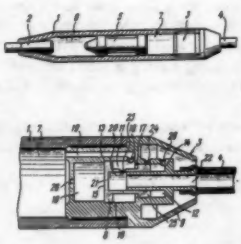
PNEUMATIC PERCUSSIVE DEVICE

Konstantin K. Tupitsyn, Frunze, 57a, kv. 115; Sergei Tupitsyn, Koshurnikova, 18, kv. 18; Veniamin Kamensky, Derzhavina, 5, kv. 78, and Kiselev N. Jurievich, ulitsa Linejnaya, 37/1, kv. 33, all of Novosibirsk, U.S.S.R.

Filed May 22, 1989, Ser. No. 355,171

Int. Cl.[5] E21B *4/14*

U.S. Cl. 175—296 **6 Claims**



1. A pneumatic percussive device, comprising a casing (1), a movable hammer piston (5) accommodated in the casing (1) dividing the interior space of the casing (1) into two chambers (6, 7), the first chamber (6) being defined by walls of the casing (1) and the hammer piston (5), and the second chamber (7) being defined by the hammer piston and an air distribution arrangement (3) accommodated in the casing (1) and having a movable actuator member (8, 29, 46) dividing the interior space of the air distribution arrangement (3) into at least two cavities (10, 30, 47 and 11, 33, 11*a*), the first cavity (10, 30, 47) permanently communicating with the second chamber (7) by means of a throttling passage (27, 32, 49), the pressure in said first cavity (10, 30, 47) ensuring movement of the actuator member (8, 29, 46) to one of its limit positions, the second cavity (11, 33, 11*a*) permanently communicating with the second chamber (7) and alternately communicating with a compressed air source and the environment.

4,964,478

ELECTRONIC BALANCE WITH SCALE ON TOP

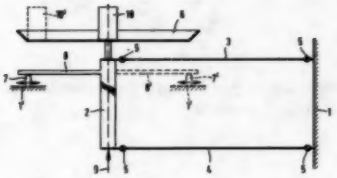
Eberhard Stadler; Matthias Eger, both of Göttingen; Franz-Josef Melcher, Hardegsen, and Veronika Martens, Göttingen, all of Fed. Rep. of Germany, assignors to Sartorius AG, Göttingen, Fed. Rep. of Germany

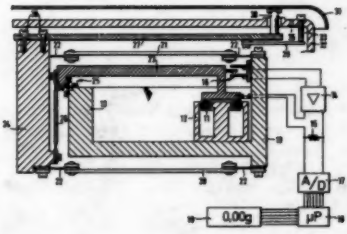
Filed Dec. 11, 1989, Ser. No. 448,501

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1988, 3841674

Int. Cl.[5] G01G *3/08, 21/24*

U.S. Cl. 177—229 7 Claims





1. An electronic balance with a scale on top with a housing and with a load receiver which is connected via an upper guide and a lower guide in the form of a parallel guide means in a resilient fashion to points fixed to the housing, comprising at least one leaf spring is provided between the load receiver and the points fixed to the housing for corner-load correction and that the effective spring constant of the leaf spring can be varied.

4,964,479

WEIGHT SCALE COMPENSATING FOR TARE

Kunio A. Sumida, 1114 N. Kenter Ave., Los Angeles, Calif. 90049

Filed Oct. 10, 1989, Ser. No. 418,523

Int. Cl.[5] G01G *3/02, 23/14*

U.S. Cl. 177—233 8 Claims

1. In combination for weighing an article,

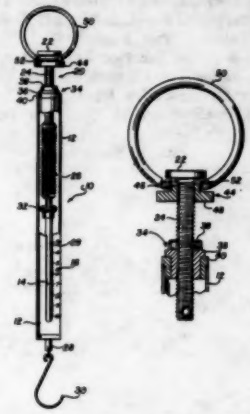
a hollow housing having a longitudinally extending opening and having indications of weight at progressive positions in the longitudinal direction,

a bolt having a head disposed externally of the housing and having a threaded shank extending longitudinally into the housing,

a spring attached at one end to the shank of the bolt and having properties of being coupled to the article at the other end to become constrained in accordance with the weight of the article,

a retaining nut disposed in the housing and having a threaded aperture to receive the shank of the bolt and to provide for an adjustment in the positioning of the bolt to compensate for tare, and

packing means disposed in co-operative relationship with the retaining nut for receiving the bolt to retain the bolt in fixed positioning after the adjustment of the bolt to compensate for tare, the packing means including a packing member only partially tapped to provide for an increase in



the force required to adjust the position of the bolt relative to the locking nut.

4,964,480

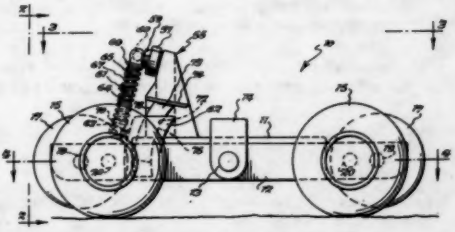
ALL-TERRAIN VEHICLE

John F. Kopczynski, 1671 Sweeney St., North Tonawanda, N.Y. 14120

Filed Dec. 21, 1989, Ser. No. 454,420

Int. Cl.[5] B62D *61/10*

U.S. Cl. 180—22 67 Claims



1. A vehicle comprising a body, elongated links having outer end portions, pivot means mounting said elongated links on opposite sides of said body with said outer end portions extending beyond said body, inner and outer sides on said elongated links, a main wheel mounted outwardly of said outer side of each of said end portions of said elongated links, an auxiliary wheel mounted inwardly of said inner sides of each of said elongated links, and said auxiliary wheels on said links extending further outwardly away from said body than said main wheels to thereby engage an obstruction in the path of both in advance of the other.

4,964,481

STEERING SYSTEM FOR VEHICLES

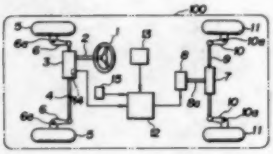
Shoichi Sano, Tokyo; Yoshimi Furukawa, and Tetsuro Hamada, both of Tochigi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 684,613, Dec. 21, 1984. This application Jan. 10, 1985, Ser. No. 690,167

Claims priority, application Japan, Jan. 13, 1984, 59-4597; Jan. 13, 1984, 59-4598; Jan. 13, 1984, 59-4599; Jan. 13, 1984, 59-4600

Int. Cl.[5] B62D *5/06*

U.S. Cl. 180—140 **12 Claims**



1. A steering system for a vehicle having a steerable front wheel and a steerable rear wheel, comprising:

a front wheel steering mechanism for steering said front wheel;

a rear wheel steering mechanism for steering said rear wheel in dependence on travelling state quantities of said vehicle; and

said rear wheel steering mechanism (7, 8, 9, 10, 12, 13, 14, 15) including:

actuation means (7, 8, 9, 10) for actuating said rear wheel;

detection means (13, 14, 15) for detecting said travelling state quantity (δ_f, V, α_a);

control means (12) connected to said detection means and adapted to supply a control signal (d) to said actuation means; and

said control means having:

first process means (A, B) receiving an output signal (x, y, α_0) from said detection means to produce a first signal (d_0) representing an ordinary steering angle for said rear wheel;

second process means (13, 14, 15, D, E, F, G) also receiving said output signal (X, Y, α_0) from said detection means for deriving data (K_r, μ_r, P_r, W_r)) relating to at least a cornering power (K_r) of said rear wheel and for producing a second signal (d_2) for correcting said first signal on the basis of said data; and

synthesizing means (C) for synthesizing said first signal and said second signal to produce said control signal.

4,964,482

LOUDSPEAKER ENCLOSURE

John E. Meyer, 25 Deanewood Crescent, Don Mills, Ontario, Canada M3B 1M6

Filed Feb. 23, 1989, Ser. No. 314,016

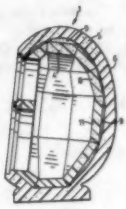
Int. Cl.[5] H05K *5/00*

U.S. Cl. 181—146 **12 Claims**

1. A loudspeaker enclosure, comprising:

a one-piece molded hollow structure having an inner surface and defining at least one opening with mounting means for attachment of a loudspeaker which when mounted in said opening coacts with the enclosure to project sound, the structure being formed of a rigid and substantially acoustically inert material; and

an inner shell being attached to the inner surface of the one-piece hollow structure, the inner shell being formed of a semi-rigid, acoustically absorbent material having a coating of a plastic material which forms an interface



between the inner shell and the inner surface of the one-piece hollow structure.

4,964,483

MOTOR SCOOTER

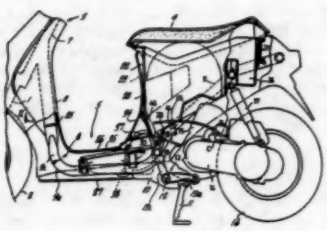
Masashi Yokoyama, Tokyo, and Naoki Hara, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1988, Ser. No. 247,519

Claims priority, application Japan, Sep. 25, 1987, 62-241897; Jan. 11, 1988, 63-1169[U]

Int. Cl.[5] B60P *3/22*

U.S. Cl. 180—219 **13 Claims**



1. A motor scooter comprising:

a frame mounting longitudinally spaced front and rear wheels;

a body cover covering said frame and having a seat mount thereon;

a foot rest floor positioned forwardly of said seat mount;

a fuel tank assembly including a fuel tank positioned below said foot rest floor;

a luggage compartment positioned below said seat and having a front lower portion disposed adjacent the rear of said fuel tank;

a functional parts accommodating space disposed in a dead space within said seat mount between said luggage compartment front lower portion and said rear of said fuel tank; and

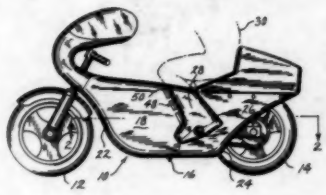
a fuel filler mouth penetrating the rear portion of said fuel tank toward one lateral side of said fuel tank top surface and a fuel pump positioned over the other lateral side of said fuel tank top surface within said functional parts accommodating space.

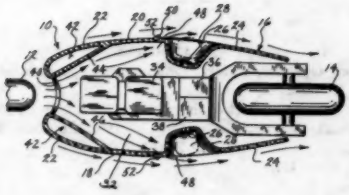
4,964,484

MOTORCYCLE FAIRING

Erik Buell, Mukwonago, Wis., assignor to Buell Motor Company, Inc., Mukwonago, Wis.

Filed Apr. 6, 1989, Ser. No. 335,097
Int. Cl.[5] B60K *11/08*; B62D *23/00, 61/02*
U.S. Cl. 180—219 **8 Claims**





1. A motorcycle fairing for enclosing the engine and other components of the motorcycle and providing a streamlined surface, said fairing comprising:

a left body portion and a right body portion, each of said portions having a forward segment disposed fowardly of the rider's leg and a rear segment disposed rearwardly of the rider's leg and a leg receiving recess disposed between said forward and rear segments,

said left and right body portions defining a cavity with the engine and other components of the motorcycle disposed within said cavity,

an air inlet port disposed between said forward segments of said left and right body portions for introducing moving air into said cavity to cool the engine,

at least one air outlet port disposed at the rear of said forward segment immediately adjacent said leg recess so that air exiting said cavity from said outlet port will become part of and contribute to the laminar air flow across said recess.

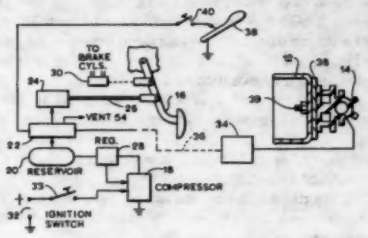
4,964,485

BACK-UP SAFETY DEVICE AND METHOD

Joseph R. Miele, West Nyack, N.Y., assignor to BackStop, Inc., Northvale, N.J.

Filed Apr. 18, 1989, Ser. No. 339,818
Int. Cl.[5] B60T *7/12*
U.S. Cl. 180—275 **14 Claims**

1. An automatic back-up brake device for vehicles with hydraulic brakes, said device comprising, in combination, a vehicle with a hydraulic brake system having an actuating member movable to apply the brakes to stop said vehicle, pneumatic means for selectively actuating said actuating member to apply said brakes to said vehicle, an electrically driven compressor, a compressed air reservoir connected to the outlet of said compressor regulator means, control means for energizing said compressor only when the need therefor is sensed by said regulator means, detecting means for detecting an object with which a collision could occur at the rear of said vehicle, and actuating valve means responsive to said detecting means



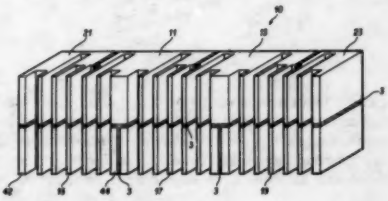
for conducting pressurized air to said pneumatic means from said reservoir to apply said brakes to stop said vehicle.

4,964,486

CINDER BLOCK MODULAR DIFFUSOR

Peter D'Antonio, Largo, Md., and John H. Konnert, Reston, Va., assignors to RPG Diffusor Systems, Inc., Largo, Md.

Filed Nov. 6, 1989, Ser. No. 431,834
Int. Cl.[5] F04B *1/02*; G10K *11/26*
U.S. Cl. 181—285 **7 Claims**



1. A cinder block modular diffusor comprising:

(a) a plurality of cinder blocks, each of which includes a plurality of wells, said wells being of particular depths with respet to one another which are determined by use of a quadratic-residue number theory sequence, wherein each consecutive well is given a number from 0 to n, where n equals one less than a total number of wells, and wherein a depth of any particular well is determined by squaring said number for said particular well and dividing said squared number by a chosen modulus number resulting in a remainder, the remainder after said dividing being multiplied by a chosen constant to arrive at said depth of said particular well, each of said cinder blocks including at least a portion of a complete sequence of wells;

(b) said cinder blocks being assembled together with mortar to combine together to comprise an integrated acoustical diffusor having said complete sequence of wells.

4,964,487

DEVICE FOR SUPPORTING A MECHANIC IN A HORIZONTAL POSITION ABOVE AN AUTOMOTIVE VEHICLE ENGINE COMPARTMENT

A. LeVan Webb, and Margaret Webb, both of Rte. 2, Box 1760, Lakeside, Ariz. 85929

Filed Jan. 8, 1990, Ser. No. 462,081
Int. Cl.[5] B25H *5/00*
U.S. Cl. 182—82 **4 Claims**

1. A device for supporting a mechanic in a horizontal position above an automotive vehicle engine compartment comprising:

(A) a base embedded in a floor;

(B) a first hollow tubular support post fixedly attached to said base to extend in a vertical direction upwardly from the floor, said first support post having a top end located above the floor, a bottom end located beneath the floor and a length dimension as measured between said top end and said bottom end, and a fastener receiving hole defined therethrough adjacent to said top end;

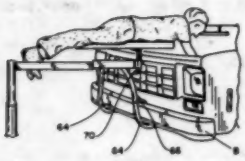
(C) a second support post slidably received in said first support post to move in the vertical direction, and including

(1) a top end and a bottom end, with said bottom end being received in said first support post;

(2) a length dimension measured between said second support post top end and said second support post bottom end,

(3) a plurality of fastener-receiving holes defined through said second support post near said second support post bottom end, said fastener-receiving holes being spaced apart from each other along the second support post length dimension, and

(4) a notch defined in said second support post top end;



(D) a first pivot arm having a proximal end fixedly attached to said second support post top end and received in said notch, said first pivot arm extending horizontally above the floor and including a distal end with a pivot pin in said distal end, said pivot pin extending in the vertical direction;

(E) a second pivot arm having a proximal end attached to said pivot pin, said second pivot arm extending horizontally and pivoting in the horizontal plane with respect to said first pivot arm, said second pivot arm having a distal end and a second pivot pin in said second pivot arm distal end;

(F) a lifting element attached to said second pivot pin and having a lifting means which moves in the vertical direction toward and away from said second pivot arm distal end;

(G) a user support attached to said lifting means to move therewith up and down in the vertical direction; and

(H) said first support post length dimension and said second support post length dimension being sufficient to elevate said user support above an automotive vehicle engine compartment.

4,964,488

LADDER STABILIZER

John V. Stewart, 1308 Henry Balch Dr., Orlando, Fla. 32810

Filed Jan. 13, 1989, Ser. No. 297,695

Int. Cl.[5] E04C *5/36*

U.S. Cl. 182—172 **6 Claims**

1. In combination with a portable ladder having steps attached to rails, an improvement for stabilizing said ladder, wherein the improvement comprises:

an elongated rigid brace;

an elongated rigid arm;

a first and second hinge;

one end of said brace attached to said first hinge;

one end of said arm attached to said second hinge, and the other end attached to said brace; and

said hinge attached to a rail of said ladder, with hinge axes approximately parallel to said rail and spaced from said

rail to provide a range of hinge rotation greater than 180 degrees.

4,964,489

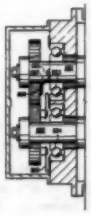
JET SPRAY SLINGER

Ajitkumar G. Patel, Oxford, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 117,757, Nov. 5, 1987, abandoned. This application Dec. 20, 1988, Ser. No. 286,975

Int. Cl.[5] F01M *9/06*

U.S. Cl. 184—13.1 **3 Claims**



1. A lubricating device for attachment to a rotating shaft comprising:

a circular plate having a central opening adapted to receive the shaft; and

a peripherally disposed tubular trough, the trough having both radially and axially disposed holes formed therein.

4,964,490

PIN TYPE DISC BRAKE

Namio Watanabe, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo and Akebono Research and Development Centre Ltd., Saitama, both of, Japan

Filed May 9, 1989, Ser. No. 349,543

Claims priority, application Japan, May 24, 1988, 63-68197[U]

Int. Cl.[5] F16D *65/02*

U.S. Cl. 188—73.44 **6 Claims**

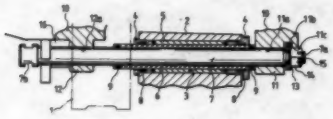
1. A pin type disc brake for use in a vehicle, comprising:

a disc rotatable with a vehicle wheel;

a support member fixed to a stationary part of the vehicle, said support member being disposed to extend to the vicinity of a periphery of said disc, said support member being provided with a through hole extending along an axis of said disc;

a caliper disposed to stride over the periphery of said disc, said caliper urging a pair of friction pads into frictional engagement with said disc, said caliper being provided at two positions on the axis of said disc with a first and a second extension arm extending along a circumferential direction of said disc, both said first and second extension arms being provided with boss holes which have a common axis, said first extension arm being provided with a recessed portion and an abutment portion having a flat surface;

a guide pin inserted in said through hole of said support member so as to be slidable therewith, said guide pin being



fitted in boss holes of said first and second extension arms, said guide pin having a threaded portion at one end thereof;

means for preventing said guide pin from moving along the axis of said disc fitted in said recessed portion of said first extension arm; and

means for preventing said guide pin from rotating having a flat face abutting said flat surface of said abutment portion of said first extension arm and being screwed to said threaded portion of said guide pin,

wherein said guide pin is inserted from said boss hole of said second extension arm to said boss hole of said first extension arm.

4,964,491

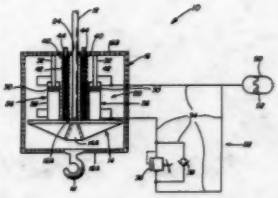
SYSTEM FOR LIMITING SNAP LOAD INTENSITY

James H. Dombrowski, San Diego, Calif.; Herbert L. Mummery, Kaneohe, Hi.; Roger W. Buecher, Kaneohe, Hi., and Isao R. Yumori, Kaneohe, Hi., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 11, 1989, Ser. No. 380,950

Int. Cl.[5] F16F *9/46*

U.S. Cl. 188—299 **7 Claims**



1. A system for limiting the intensity of a snap load in a cable having tensile limits which is supporting an object, comprising:

a floating plate connected to the cable;

a housing connected to the object, said floating plate being disposed within said housing;

an arcuatable mechanism extending between and connected to the floating plate and the housing, the actuatable mechanism being movable from an initial position toward a deflected position in response to a snap load produced in the cable, the actuatable mechanism being disposed within the housing; and

means coupled to the actuatable mechanism for generating a shock load within the actuatable mechanism in response to the cable snap load, the shock load permitting movement of the actuatable mechanism towards the deflected position while limiting the snap load within the tensile limits of the cable.

4,964,492

DAMPER FOR A HYDROPNEUMATIC SUSPENSION ELEMENT OF A VEHICLE, AND IN PARTICULAR A HEAVY VEHICLE

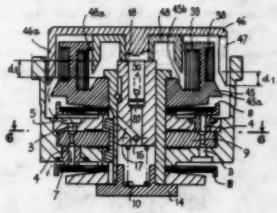
Philippe Joseph, Carpentras, France, assignor to S.A.M.M.-Societe d'Applications des Machines Motrices, Bievres, France

Filed Feb. 24, 1989, Ser. No. 314,859

Claims priority, application France, Feb. 26, 1988, 88 02426

Int. Cl.[5] B60G *17/08*; F16F *9/46, 9/50*

U.S. Cl. 188—299 **16 Claims**



1. A damper for a hydropneumatic suspension element of a vehicle, said damper comprising a fixed body having an axis, ports for the passage of hydraulic fluid through said body provided in the body, rigid deflectors placed on each side of the body in facing relation to the ports of the body, stacks of elastically flexible metal washers located within the deflector on each side of the body, means for allowing the passage of the fluid in only one direction for some of the ports and in the opposite direction for the other ports, a rotatable disc disposed in the body, at least two series of orifices of different diameters provided in the disc for the passage of said fluid and corresponding to different adjustments of the damping, the orifices being arranged to be capable of coming into facing relation to the ports of the body, means for rotating the disc through a given angle so as to place one of said series of orifices in correspondence with the ports of the body, and means for controlling the rotation of the disc.

4,964,493

SHOCK ABSORBER WITH VARIABLE DAMPING CHARACTERISTICS DEPENDING UPON STROKE SPEED

Tamotsu Yamaura; Fumiyuki Yamaoka, and Mitsuo Sasaki, all of Kanagawa, Japan, assignors to Atsugi Motor Parts Company, Limited, Kanagawa, Japan

Filed Apr. 5, 1989, Ser. No. 333,337

Claims priority, application Japan, Apr. 6, 1988, 63-46494[U]; Apr. 6, 1988, 63-46495[U]; Apr. 7, 1988, 63-46966[U]; Jan. 12, 1989, 1-2578[U]

Int. Cl.[5] F16F *9/348*

U.S. Cl. 188—322.15 **19 Claims**

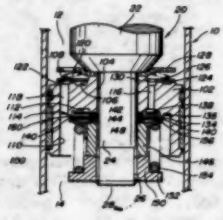
1. A flow restriction valve unit in a hydraulic shock absorber, which valve unit is provided in one of a piston assembly or a bottom valve assembly and associated with a fluid path for communication between first and second fluid chambers, comprising:

a flow restricting orifice forming a part of said fluid path for permitting fluid flow therethrough at a first limited flow rate;

a first upstream valve associated with said flow restricting orifice and normally closing one end of said orifice for blocking fluid communication between said first and sec-

oad fluid chambers, and being responsive to fluid pressure difference between said first and second fluid chamber greater magnitude than a predetermined first magnitude to open said one end of said orifice to establish fluid communication between said first and second fluid path for permitting fluid flow from said first fluid chamber to said second fluid flow chamber, said first upstream valve including a first resiliently deformable valve member which is normally biased in a direction for closing said one end of said orifice and deformable to increase fluid path area according to increasing fluid pressure difference between said first and second fluid chambers;

a second downstream valve associated with said first upstream valve and arranged downstream of said first upstream valve in series with the latter with respect to the fluid flow from said first fluid chamber to said second fluid chamber, said second downstream valve having a predetermined constant and minimum flow path area of flow restriction path for communication between the downstream of said first upstream valve and said second fluid chamber for providing a predetermined maximum magni-



tude of fluid flow restriction when the fluid pressure difference between said downstream of said first upstream valve and said second fluid chamber to be smaller than or equal to a second predetermined magnitude, and being responsive to the fluid pressure difference between said downstream of said first upstream valve and said second fluid chamber to be greater than a second predetermined magnitude to shift for increasing said fluid path area,

said second downstream valves being so cooperated with said first upstream valve as to provide linear variation of damping force in accordance with variation speed of fluid pressure difference;

said second downstream valve including a second resiliently deformable valve member which is normally biased in a direction for providing the minimum path area and deformable to increase fluid path area according to increasing fluid pressure difference between the downstream of said first upstream valve and second fluid chambers; and

a stopper means disposed between said first upstream and second downstream valves for defining a maximum deformation magnitude of said first valve member of said first upstream valve means.

4,964,494

LOCKING DEVICE CONSISTING OF A BOLT LOCK AND KEY-ACTUATED LOCK CYLINDER

Armin Elsermann, Velbert, Fed. Rep. of Germany, assignor to Schulte-Schlagbaum Aktiengesellschaft, Velbert, Fed. Rep. of Germany

Filed Apr. 27, 1989, Ser. No. 344,272

Claims priority, application Fed. Rep. of Germany, May 7, 1988, 3815716; May 7, 1988, 3815715; May 7, 1988, 3815714

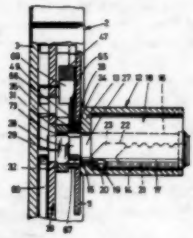
Int. Cl.[5] G07F 17/12

U.S. Cl. 194—253 **28 Claims**

1. A locking device operative by use of a first key and a second removal key which is different from said first key, the locking device comprising

a bolt lock, a bolt actuation device, and a key-actuated lock cylinder having a locking member; and wherein

the lock cylinder with its locking member is in coupling engagement with said bolt-actuation device and is remov-



able from said bolt lock only with the use of said second removal key; and

said locking device includes a catch while drops upon removal of said lock cylinder and prevents re-insertion of said lock cylinder.

4,964,495

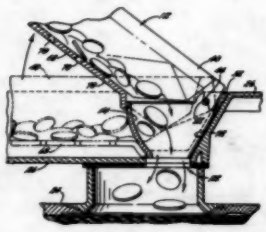
PIVOTING TRAY FOR COIN SORTER

James M. Rasmussen, Chicago, Ill., assignor to Cummins-Allison Corporation, Mt. Prospect, Ill.

Filed Apr. 5, 1989, Ser. No. 336,080

Int. Cl.[5] G07F 1/04

U.S. Cl. 194—344 **4 Claims**



1. In a coin handling machine,

a tray for holding coins to be fed into the machine, said tray having a bottom wall and side walls extending upwardly therefrom,

a coin feed chute disposed adjacent one side of said tray with at least a portion of the side walls of said chute extending above the bottom wall of said tray and forming a portion of the side walls of said tray,

said tray being pivotally mounted for raising the bottom of the tray upwardly along and to at least the top of the side walls of said chute so that coins in said tray will slide downwardly along the bottom wall of said tray and over the side wall of said chute and into said chute, when the tray is pivoted upwardly.

4,964,496

MASS TRANSIT SYSTEM

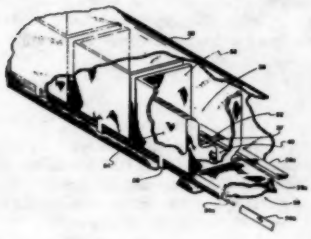
Fred F. Dexter, Jr., 2311 S. Blvd., Houston, Tex. 77098

Continuation-in-part of Ser. No. 330,857, Mar. 31, 1989, abandoned, which is a continuation-in-part of Ser. No. 893,741, Aug. 6, 1986, Pat. No. 4,828,099, which is a continuation-in-part of Ser. No. 661,427, Oct. 6, 1984, abandoned. This application Dec. 20, 1989, Ser. No. 453,577

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.[5] B65G *15/00*

U.S. Cl. 198—324 **12 Claims**



1. A mass transit system, comprising:

at least two train stations, each having at least one platform revolving about its center;

each revolving platform having a curvilinear track, a center hole, a curvilinear outer edge, and a cylindrical outer wall;

said curvilinear track extending radially inwardly from said curvilinear outer edge;

stationary track means positioned between said platforms;

an endless flexible member driven by said revolving platforms at a substantially constant speed and being maintained under tension around said cylindrical outer walls of said revolving platforms so as to have substantially zero velocity relative to said outer walls of said revolving platforms;

a plurality of cars carried by said flexible member, and said cars together forming an endless train driven by said flexible member at said substantially constant speed; and

said train riding over said stationary track means and over said curvilinear tracks on said platforms.

4,964,497

WORKING METHOD AND APPARATUS FOR WORKPIECE BEING CONVEYED

Isao Bando; Kouzou Hanuki, and Mikiya Ito, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 20, 1989, Ser. No. 382,446

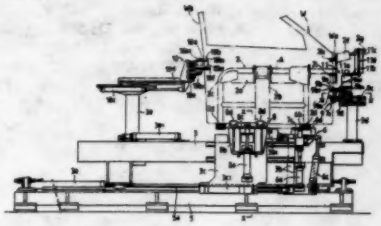
Claims priority, application Japan, Jul. 22, 1988, 63-183358

Int. Cl.[5] B65O *43/00*

U.S. Cl. 198—341 **4 Claims**

1. In a working method for a workpiece being conveyed wherein a movable base is provided alongside of a conveyor conveying a workpiece mounted on a carrier which is movable in the longitudinal direction in which said workpiece is conveyed, and a robot mounted on the movable base is used to apply predetermined working to the workpiece being conveyed by the conveyor, an improvement comprising the steps of:

carrying out successively: detecting the carrier, clamping the carrier by a clamping means provided on the movable base, and positioning the workpiece on the carrier by a positioning means provided on the movable base in three



orthogonal directions with respect to the movable base and holding the workpiece in that position; and

thereafter operating the robot.

4,964,498

DEVICE FOR CONVEYING WORKPIECES

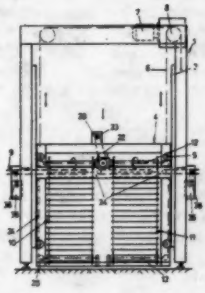
Karl-Heinz Klingl, Neusäss, Fed. Rep. of Germany, assignor to Georg Spiess GmbH, Gersthofen, Fed. Rep. of Germany

Filed Jun. 28, 1989, Ser. No. 372,895

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1988, 3824230

Int. Cl.[5] B65G *1/12*

U.S. Cl. 198—347.1 **17 Claims**



1. A method for conveying workpieces in sequence along a conveying path in a step-by-step fashion for buffering workpieces, comprising the steps of:

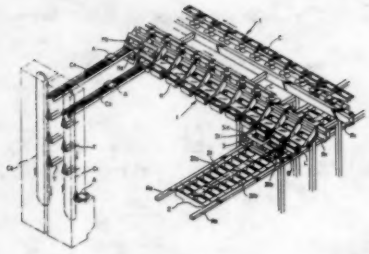
diverting the workpieces from the conveying path to and along at least one loop path temporary storage device having two temporary storage paths moving the two temporary storage paths in opposite directions to one another, changing a length of each said temporary storage path jointly depending upon an increase or a decrease in a degree of filling of said temporary storage device, whereby after two steps of the conveying path for each loop path, the temporary storage device is moved by one step when the temporary storage paths thereof are stationary and, after each movement of the temporary storage paths with the temporary storage device being inactive, transferring of the workpieces from an end of one temporary storage path to an end of another temporary storage path takes place, said transferring taking place parallel to the conveying path.

4,964,499

SORTING CONVEYOR SYSTEM

Akira Morikiyo, Tokorozawa; Ryuji Morimoto, Osaka, and Misao Yamahata, Tokorozawa, all of Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

Filed Apr. 3, 1989, Ser. No. 331,868
Claims priority, application Japan, Apr. 28, 1988, 63-103980
Int. Cl.[5] B65G 47/10
U.S. Cl. 198—365 4 Claims



1. A sorting conveyor system comprising a take-in conveyor having a plurality of take-in vessels for introducing articles at random:

a sorting conveyor having a plurality of rows of sorting vessels crossing with said take-in conveyor at a lower level;

a timing basket table including a plurality of timing baskets disposed between the take-in conveyor and the sorting conveyor, whereby the timing basket table may receive articles from the take-in conveyor and discharge the articles to the sorting conveyor at said crossing positions; and

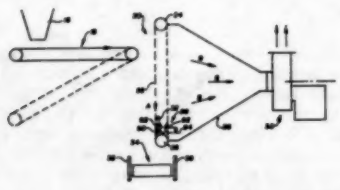
reciprocating means at said timing basket table to reciprocate said timing baskets horizontally in directions parallel to said sorting conveyor from a first position overlying one sorting vessel to a second position overlying another sorting vessel.

4,964,500

TABACCO PROCESSING PNEUMATIC ALIGNMENT METHOD AND APPARATUS

Eldon Gooden, Rte. 1, Box 1500, Quinton, Va. 23141

Filed Aug. 1, 1989, Ser. No. 387,812
Int. Cl.[5] B65G 47/24
U.S. Cl. 198—380 33 Claims



1. An apparatus for orienting articles so as to be disposed parallel to a direction of conveyance, comprising:

first roller means;

second roller means mounted vertically below said first roller means;

a conveyor belt element mounted to and extending between said first and second roller means to define therewith a main conveyance path, said main conveyance path having a front side and a back side;

means for generating an air current through at least a portion of said main conveyance path from said front side to said back side so that articles projected towards said front side of said main conveyance path are held thereagainst by said air current;

means for driving at least one of said conveyor belt element, said first roller means, and said second roller means so that articles are conveyed on said front side of said main conveyance path in a direction from said first roller means toward said second roller means; and

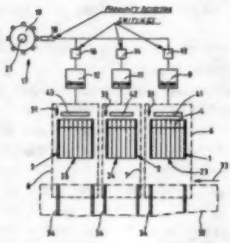
continuously driven take-off conveyance means defining a take-off conveyance path vertically below said second roller so as to intersect a vertical plane defined through said first and second roller means for receiving articles from said main conveyance path and for orienting at least articles having their longitudinal axes disposed substantially parallel to a direction of conveyance of said main conveyance path substantially parallel to a direction of conveyance of said take-off conveyance path.

4,964,501

APPARATUS FOR TRANSFERRING LAYERS OF ROD-SHAPED ARTICLES IN PACKING MACHINES

Gottfried Hoffmann, Schwarzenbek; Reinhard Deutsch, Geesthacht, and Horst Symannek, Neubörnsen, all of Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Jul. 28, 1989, Ser. No. 387,150
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1988, 3827432
Int. Cl.[5] B65G 57/00
U.S. Cl. 198—418.3 11 Claims



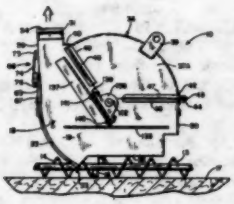
1. Apparatus for transferring layers of elongated parallel rod-shaped articles having predetermined diameters, particularly rod-shaped articles of the tobacco processing industry, comprising a magazine including a series of neighboring article-containing ducts having lower ends arranged to discharge a succession of layers, the lower ends of said ducts being disposed at different levels with a mutual spacing matching or approximating a predetermined diameter; a transporting device having a series of receptacles and being operative to place successive receptacles of said series into register with the lower ends of successive ducts of said series of ducts; means for transferring layers from the lower ends of said ducts into registering receptacles of said transporting device, comprising an endless conveyor for each of said ducts and at least one expelling element provided on each conveyor and operative to move a layer of articles from said lower end of the respective duct into the registering receptacle in the longitudinal direction of the articles, said transferring means further comprising a discrete prime mover for each of said endless conveyors and discrete starting and arresting means for each of said prime movers; and means for operating said starting and arresting means so as to start said conveyors in a predetermined sequence and to arrest said conveyors in the same sequence.

4,964,502

IMPELLER ASSEMBLY

Floyd E. Buschbom, Long Lake, Minn., assignor to Van Dale, Inc., Long Lake, Minn.

Filed Aug. 1, 1989, Ser. No. 388,140
Int. Cl.[5] B65G 31/04
U.S. Cl. 198—642 55 Claims



1. A material handling apparatus comprising: a housing having a first side wall, a second side wall laterally spaced from the first side wall, and an end wall secured to said side walls, said housing having a chamber with a material inlet opening and a material outlet opening spaced from said inlet opening, said end wall having an inside surface extended between said inlet and outlet openings, means located in engagement with at least a portion of the inside surface of said end wall to minimize collection of material on said end wall, said means comprising a sheet member of low friction and abrasion resistant plastic covering a section of the inside surface of the end wall extending from the inlet opening toward the outlet opening, means including grooves between the first and second side walls and the end wall for holding said sheet member on the end wall and allowing the sheet member to be removed from the housing, said sheet member having opposite edge portions located in said grooves thereby holding the sheet member adjacent said end wall, impeller means located within said chamber of the housing operable to move material from the inlet opening and discharge the material through the outlet opening, and means rotatably mounting the impeller means on said housing whereby upon rotation of said impeller means material moves from the inlet opening along said sheet member toward the outlet opening and is discharged through said outlet opening.

4,964,503

MANIPULATOR USING A SINGLE MOTOR DRIVING PLURAL FLEXIBLE SHAFTS

Toru Nishiyama, Ayase, and Hiroshi Minakami, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 12, 1988, Ser. No. 282,546
Claims priority, application Japan, Dec. 10, 1987, 62-187087[U]
Int. Cl.[5] F16D 21/02, 27/12, 67/02; B25J 9/00
U.S. Cl. 192—12 D 9 Claims

1. In a manipulator

a first element which is movable along a first axis;

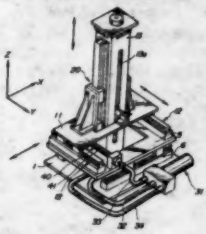
a second element which is movable along a second axis, said second axis being arranged to extend normally to said first axis;

a third element, said third element being movable in a direction which is normal to a plane containing said first and second axes;

a motor;

a first, second and third flexible shafts, said first, second and third flexible shafts being operatively connected with said first, second and third elements, respectively in a manner wherein rotational motion of said flexible shafts is translated into linear motion of the elements, and

power transmission means for selectively interconnecting said flexible shafts with said motor, said power transmission means including clutch means which enables the



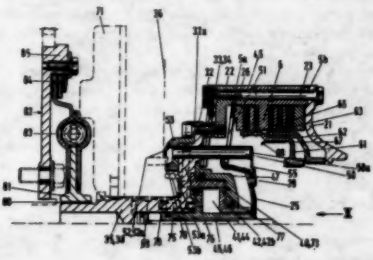
selective connection of said first, second and third flexible shafts to said motor.

4,964,504

MULTIPLE CLUTCH ASSEMBLY

Oswald Friedmann, Lichtenau, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Dec. 16, 1988, Ser. No. 286,378
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1987, 3743227
Int. Cl.[5] F16D 21/06, 25/10, 13/72
U.S. Cl. 192—48.4 71 Claims



1. A multiple clutch assembly, particularly for use with automatic transmissions, wherein one clutch of the assembly is operative to start the transmission of torque from an input element to at least one output element and plural clutches are operative to transmit torque during a change of gear ratio for power shifting, comprising first and second clutches each having rotary driving and driven means and operating means actuatable to selectively couple said driving means with an disconnect said driving means from the respective driven means, each of said operating means comprising a lever including at least one prestressed diaphragm spring and a cylinder and piston unit for moving the respective lever between a first position in which the respective driving and driven means are coupled to each other and a second position in which the respective driving and driven means are disconnected from said other, one of said units being at least partially confined in the other of said units and said levers being disposed at the same side of the respective driven means.

4,964,505

LOCKING SYNCHRONIZING MEANS FOR TRANSMISSON SHIFTS

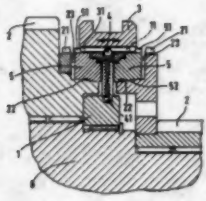
Rolf Lutz, Tettnang; Franz Reinalter, Friedrichshafen, and Heinz Flechtner, Mardorf, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedshafen, Fed. Rep. of Germany

PCT No. PCT/EP87/00142, § 371 Date Aug. 26, 1988, § 102(e) Date Aug. 26, 1988, PCT Pub. No. WO87/05675, PCT Pub. Date Sep. 24, 1987

PCT Filed Mar. 11, 1987, Ser. No. 272,773

Int. Cl.[5] F16D *21/04, 23/06, 9/00*

U.S. Cl. 192—53 F 1 Claim



1. A locking synchronization device for transmission shifting, comprising:

a shaft;

a gear rotatable relative to said shaft and having a first array of coupling teeth;

a carrier rotatable with and axially fixed to said shaft;

a sliding sleeve axially shiftable relative to said carrier and rotationally coupled therewith, said sliding sleeve having a second array of coupling teeth axially interengageable with the coupling teeth of said first array upon synchronization of rotation of said gear and said sliding sleeved and axial displacement of said sliding sleeve into engagement with said first array of coupling teeth on said gear sliding sleeve being axially shiftable in a transmission-shifting path including a forward and a reverse speed of a transmission;

a synchronizing ring rotatable relative to said sliding sleeve and having an array of locking teeth engageable with the coupling teeth of said second array on said sliding sleeve upon frictional retardation of angular displacement of said synchronizing ring with said sliding sleeve to limit axial displacement of said sliding sleeve toward said gear and lock out coupling of said sliding sleeved with said first array of coupling teeth on said gear until synchronization of said sliding sleeve and said gear has occurred and upon consequent release of said coupling teeth of said second array by said locking teeth;

at least one engagement pin interposed between said carrier and said sliding sleeve to angularly interconnect said sliding sleeve and said sychronizing ring, said synchronizing ring and said gear having mutally engaging frictrional surfaces frictionally coupling said gear with said synchronizing ring for power transmission therebetween whereby the rotational speeds of said sliding sleeve and said gear are synchronized to permited said coupling teeth of said first and second arrays to interengage;

means for automatically relieving locking engagement of said locking teeth against the coupling teeth of said secondary array on said sliding sleeve upon a large speed differential between said shaft and said gear tending to overload said frictional surfaces, thereby permitting axial shifting of said sliding sleeve toward said gear; and

means including juxtaposed ends of the coupling teeth of saif first and second arrays for generating a driver-alerting grinding noise upon engagement of the coupling teeth of said sliding sleeve and said gear at said differential to enable a driver to interrupt shifting, said means for relieving locking engagement of said locking teeth against the coupling teeth of said second array including an abutment surface of said gear, said synchronizing ring being dimensioned to enlarge upon heating at said large speed differential between said shaft and said gear tending to overload said frictional surface and to abut said surface and relieve contact between said frictional surfaces.

4,964,506

PRESSURE BALANCED PISTONS IN AN AUTOMATIC TRANSMISSION

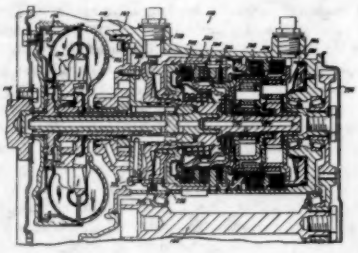
Howard L. Benford, Bloomfield Hills; Maurice B. Leising, Clawson, and Gerald L. Holbrook, Rochester Hills, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Continuation of Ser. No. 188,610, Apr. 29, 1988, abandoned.

This application Mar. 1, 1990, Ser. No. 488,419

Int. Cl.[5] F16D *25/12*

U.S. Cl. 192—106 F 4 Claims



1. In a vehicle transmission including a rotatable input member, an output member, a gear assembly for changing the ratio of torque between the input member and the output member, a plurality of ciutch assemblies for shifting between predetermined gears of the gear assembly, a rotatable fluid actuating device being coupled to the input member and being movable axially to engage and disengage at least one said clutch assembly, said fluid actuating device comprising:

means for allowing fluid to pass through the fluid actuating device to a cavity and develop centrifugal fluid pressure on one side of the fluid actuating device, thereby allowing the fluid actuating device to be returned by a spring to a non-engaged clutch position, said means comprising an orifice formed in said fluid actuating device and communicating axially therethrough; and

filter means disposed in said orifice for filtering contaminants in the fluid to prevent plugging of said orifice by the contaminants, and said filtering means comprising a screen.

4,964,507

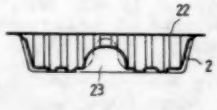
PACKING CASES FOR FROZEN SHRIMPS

Hanks Chen, No. 63, Gun Shan 1st Road, Kaohsiung, Taiwan

Filed Nov. 28, 1989, Ser. No. 442,737

Int. Cl.[5] B65D *43/00*

U.S. Cl. 206—557 1 Claim



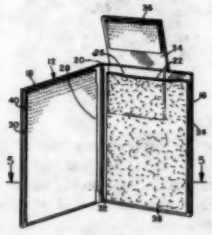
1. A packing case for frozen shrimps comprising a case body provided with a protruding-up curved section in the middle of the bottom, said protruding-up curved section possible to

consume the inflating pressure in the course of freezing shrimps so that the packing case may not be deformed during the freezing course, keeping its outer shape as original so as to be convenient for transporting.

4,964,508
KEY CACHE

Joseph W. Balsley, P.O. Box 2014, Rancho Santa Fe, Calif. 92067

Continuation of Ser. No. 296,959, Jan. 17, 1989, abandoned. This application Oct. 25, 1989, Ser. No. 427,237
Int. Cl.[5] A45C *11/32*
U.S. Cl. 206—37.1 **4 Claims**



1. A holder for a key or other item, comprising:

a first part comprising a wallet-like member having first and second panels secured together along a fold line, at least one pocket for holding a key being located on the inner face of one of said panels and having an opening for deposit and removal of items from said pocket, a releasable closure device for releasably closing said opening, and interengageable fastener means on the inner faces of said panels for releasably securing the panels together in a closed condition;

a second part comprising a flat, panel-like member having an adhesive layer on one of its faces comprising means for securing said second part to a flat surface;

interengageable fastener means on an outer face of said first part and on the opposite face of said second part to said adhesive layer for releasably securing said parts together; and

said releasable closure device comprising a pliable flap projecting from an edge of said first panel adjacent said opening and having fastener means on its inner surface identical to the fastener means on the inner surface of said second panel for releasably securing said flap to the inner surface of said first panel to close said opening.

4,964,509
UNIVERSAL SHIPPING CONTAINER FOR HAZARDOUS LIQUIDS

Thomas I. Insley, Lake Elmo, Minn.; James F. Dyrud, New Richmond, Wis., and Donald E. Young, Forest Lake, Minn., assignors to Minnesota Mining and Manufacturing Co., Saint Paul, Minn.

Filed Feb. 9, 1990, Ser. No. 477,742
Int. Cl.[5] B65D *81/26, 81/02*
U.S. Cl. 206—204 **18 Claims**

1. Universal shipping or secondary container suitable for transporting a plurality of breakable, liquid filled primary containers of various sizes and shapes, which shipping container comprises

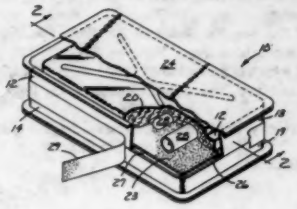
a pair of rigid shells that mate to enclose a space,

a batt of sorbent material filling each shell, which batt

has a normally substantially flat exposed surface,

is sufficiently conformable to envelop a primary container when the shells are closed, and

has sufficient body to keep the primary container at the interface between the batts when the shells are closed, and



a normally tacky, discontinuous adhesive layer on the exposed surface of the batt of at least one of the shells.

4,964,510
LASER DISK RETAINING CASE

Thomas D. Loyd, 14709 W. Burnsville Pkwy. #73, Burnsville, Minn. 55337

Filed Aug. 4, 1989, Ser. No. 389,762
Int. Cl.[5] B65D *85/57*
U.S. Cl. 206—306 **47 Claims**

1. A case for holding a disk shaped object, comprising: first and second opposed sides each side lying substantially parallel and adjacent each other and each side having an exterior surface, and each side connected to the other around common perimeters thereof by top, back, bottom and front perimeter edges extending between the opposed sides and defining an interior volume of the case, an interior disk retaining space within the interior volume, an elongate disk access slot extending through and along the front perimeter edge and communicating with the disk retaining space, an inclined plane portion within the interior volume of the case and the inclined plane portion having a top inclined edge extending downwardly in a direction from the back perimeter edge to the front perimeter edge, and a release mechanism for retaining the disk within the retaining space and the release mechanism operable for permitting removal of the disk from the retaining space.

4,964,511

PACKING CASE, PARTICULARLY FOR SHEET MATERIAL

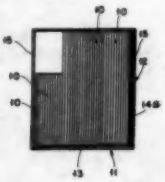
Luciano Meschi, Livorno, Italy, assignor to Wully S.A., Panama City, Panama

Division of Ser. No. 137,064, Feb. 22, 1988, Pat. No. 4,854,414, which is a continuation of Ser. No. 581,216, Feb. 22, 1984, abandoned, which is a continuation of Ser. No. 342,747, Feb. 26, 1982, abandoned. This application Aug. 11, 1989, Ser. No. 392,556

Claims priority, application Italy, Jan. 26, 1981, 20590/81[U]

Int. Cl.[5] B65D *5/00*

U.S. Cl. 206—449 19 Claims



1. A containerized storing, shipping and dispensing apparatus for containing a heavy package of paper sheets formed to each other to form a single connected sheet which is folded when placed onto the containerized packaging apparatus for shipping and storage in a closed condition and for storage and dispensing in an opened condition to provide complete accessibility to the whole contents of the containerized packaging apparatus and which enables removal of either a single sheet of the connected sheets or the entire package of sheets, consisting essentially of:

a first member consisting of a container member including a bottom panel and solely three lateral panels, each of said three lateral panels being joined to said bottom panel and being pivotal along an edge thereof, and being foldable relative thereto so that said three lateral panels can be pulled down until they are in substantially coplanar position with said bottom to provide complete accessibility to the sheets and movable out of said coplanar relationship with said bottom to a position substantially orthogonal thereto with paper sheets positioned on top of said bottom with said lateral panels adjacent to sides of the paper sheet to form a container with an open front and an open top commensurate in scope with one length dimension of the paper sheets;

said panels forming angularly related sidewalls for said container when in an upstanding position to provide a box-type packing which renders the contents thereof readily accessible and dispensable; and

said pivotally joined panels being pivotal relative to said bottom to open themselves as a fold and moved into said substantially coplanar position; and

a second member separate from said first member, comprising:

a parallelepipedal closure member having a top panel and solely four depending side walls depending therefrom, said top panel along all of its edges being fixed to said sidewalls and fitting over said three lateral panels of said container to encompass the whole lateral surface of said panels completely to close said open front and said open top to prevent dispensing of the single sheet or package of sheets and maintain said sidewalls thereof in an upright position to prevent accidental opening thereof; and

said sidewalls of said closure member being of sufficient height to fit substantially entirely over said side panels with one of said sidewalls of said closure member covering said open front to provide rigidity in containerized shipping.

4,964,512

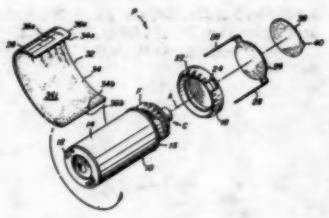
RECYCLABLE PACKAGE

Gaylynn F. Ingram, Rochester, and Evan W. Hutchison, Honeoye Falls, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 20, 1990, Ser. No. 482,448

Int. Cl.[5] B65D *65/46*

U.S. Cl. 206—459 6 Claims



1. In a package for protectively enclosing a product, the package including a container having an access opening through which the product is insertable into and removable from the container and a movable closure matable with the opening to close and open the container, the container and the closure each being made of recyclable plastic material and having an outward-facing exterior surface, an improvement comprising a label disposed on the exterior surface of one of said container and closure for displaying information relating to the product, said label being made of recyclable plastic material compatible with the plastic material of which each of said container and closure is made, so that the package can be recycled without first separating said label from said exterior surface on which it is disposed.

4,964,513

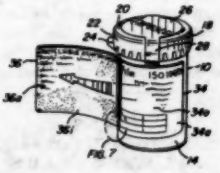
PACKAGE

Gaylynn F. Ingram, Rochester, and Evan W. Hutchison, Honeoye Falls, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 20, 1990, Ser. No. 482,423

Int. Cl.[5] B65D *65/40*

U.S. Cl. 206—459 10 Claims



1. In a package for protectively enclosing a product, the package including a container having an access opening through which the product is insertable into and removable from the container and a movable closure matable with the opening to close and open the container, the container and the closure each having an outward-facing exterior surface, an improvement comprising a label disposed on the exterior surface of one of said container and closure for displaying information relating to the product, said label including a sheet-like inner portion having an inner surface facing toward and secured to said exterior surface and an outer surface facing away from said exterior surface, said label also including a sheet-like outer portion superposed upon said inner portion, said outer portion having an inner surface facing toward and separably

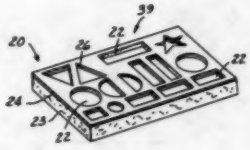
adhered to said inner-portion outer surface and an outer surface facing away from said inner portion, said inner-portion outer surface and said outer-portion inner and outer surfaces each having some of said information presented thereon, said outer portion being at least partially separable from said inner portion so that said information on said inner-portion outer surface and outer-portion inner surface can be viewed.

4,964,514

CUSTOMIZED PLASTIC TRAY AND METHOD OF MAKING SAME

Joseph S. Wycech, 1505 Huntington, Grosse Pointe Woods, Mich. 48236

Filed Jan. 26, 1989, Ser. No. 301,554
Int. Cl.[5] B65D *25/20*
U.S. Cl. 206—564 **1 Claim**



1. A plastic storage tray stored in a storage member, comprising:

a storage member having a specific width, length and height;

a sheet of structural foam having a relatively long width and length and a relatively short height, said sheet of structural foam having six faces;

a sheet of plastic bonded to said sheet of structural foam on at least one face thereof;

said sheet of structural foam having cavities of uniform height extending from said face that said plastic sheet which has been bonded to said sheet of structural foam to the opposite face;

said sheet of plastic having receiving compartments of uniform height formed therein that extend downwardly into said cavities in said sheet of structural foam;

said structural foam sheet and said plastic sheet comprising a plurality of said cavities and said receiving compartments respectively, of uniform height; and

the shape of said cavities and said receiving compartments having been formed to correspond to the profiles of a series of items that a consumer wishes to store in said plastic storage tray, there being distinct shapes of said cavities;

said sheet height, width and depth of said sheet of structural foam having been selected to approximate said height, width and length of said storage compartment; and

said plural cavities formed in said sheet of structural foam being arranged in a pattern, said pattern having been developed utilizing computer graphics to optimize the placement of the distinct shapes of said plural cavities.

4,964,515

BAG CONSTRUCTION INCLUDING EASY-OPENING PROVISION

Eugene L. Heyden, S. 627 Bernard #8, Spokane, Wash. 99204

Continuation-in-part of Ser. No. 353,211, May 16, 1989, abandoned, which is a continuation of Ser. No. 196,897, May 19, 1988, abandoned, which is a continuation of Ser. No. 41,464, Apr. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 10,189, Feb. 2, 1987, Pat. No. 4,795,270. This application Oct. 19, 1989, Ser. No. 424,054
Int. Cl.[5] B65D *3/26*
U.S. Cl. 206—632 **20 Claims**

1. A generally tubular package of flexible material having two opposing panels, a top margin comprising the top edge of said package, a bottom margin opposing said top margin, opposing side margins where said panels meet to define two opposing panel sides which extend the length of said package, and a commodity-confining compartment offset a predetermined distance from said top margin, defined by said panels, and situated between the top, bottom, and side margins of said package, said package being generally flat in the vicinity of said top margin and further comprising:

a top seal extending across the width of said package and located between said top edge and said commodity confining compartment, said top seal comprising separably joined, opposing portions of said panels;

a flat, generally tubular pocket having a closed perimeter portion defined by the configuration of said top seal wherein said top seal has a major portion which extends from one side margin across the width of said package to a location where a downwardly extending portion of said top seal progresses a substantial distance away from said top edge and extends to a location that is a substantial distance below said major portion in order to define a part of the closed perimeter portion of said tubular pocket which extends from a location adjacent said top edge to a location at the side of said commodity confining compartment, said top seal also progressing a further substantial distance both below said major portion and generally toward the other side margin of said package and to a location where said package defines a pocket side of adjoining portions of said panels, said adjoining portions completing. The closed perimeter portion of said tubular pocket in order to define a pocket interior surrounded by the flexible material of said package; and

pocket access means associated with the flexible material located at said top edge and formed by said panels above said pocket interior for allowing an elongated object to pass said top edge for entry within said pocket interior and to extend to a position within said tubular pocket that is located at the side of said commodity-confining compartment, so that said elongated object may be moved toward said commodity-confining compartment and may act to progressively separate a substantial portion of said top seal for access to a confined commodity.

12. An easy-opening provision defined by a package of predetermined width and length constructed from a tubular arrangement of flexible packaging material, said package having two opposing panels which collectively define a commodity-confining compartment, a top margin comprising the top edge of said package, opposing side margins where said panels meet to define two opposing panel sides which extend the length of said package, and a separable top seal extending across the width of said package and located between said top edge and said commodity-confining compartment, said top seal comprising separably joined, opposing portions of said panels, the opening provision comprising:

a generally flat, tubular pocket having a closed perimeter portion defined by the configuration of said top seal wherein said top seal has a major portion that progresses from one side margin across the width of said package toward the other side margin and, at a location along the width of said package, progresses a substantial distance

away from said top edge to a location that is a substantial distance below said major portion, with a substantial further progression both below said major portion and toward the other side margin of said package defining a pocket bottom and to a location where said package defines a pocket side of adjoining portions of said panels the adjoining portions completing the closed perimeter portion of said tubular pocket in order to define a pocket interior surrounded by said packaging material; and

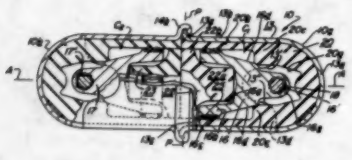
pocket access means associated with the packaging material located at said top edge and formed by said panels above said pocket interior for allowing an elongated object to pass from said top edge toward said pocket bottom for entry within said pocket so that an end of said elongated object may be placed at the side of said commodity-confining compartment and may be moved toward said commodity-confining compartment in order to progressively separate a substantial portion of said top seal and open said package for access to a confined commodity.

4,964,516

DAMPED EXTENDED-MOTTON STRUT

Richard P. Thorn, Erie Pa., assignor to Lord Corporation, Erie, Pa.

Filed Sep. 18, 1989, Ser. No. 408,830
Int. Cl.[5] B60G *13/02*
U.S. Cl. 267—140.1 **24 Claims**



1. A strut assembly for providing a motion-damped tension and compression connection between a first object and a second object comprising:

an elongate casing adapted to be disposed on an axis extending between said objects,

a first member movably mounted in said casing and adapted to be connected to said first object,

a second member movably mounted in said casing and adapted to be connected to said second object,

said first and second members also being movable relative to one another in said casing,

intermediate elastomeric means located in said casing between said members for limiting motion toward one another in the axial direction,

terminal elastomeric means located in said casing for limiting motion of said members away from one another in the axial direction,

elastomeric means providing in said casing a deformable layer disposed alongside said axis, and

ribbed means in said casing in pressure engagement with said layer and responsive to the motion of either of said members relative to said casing

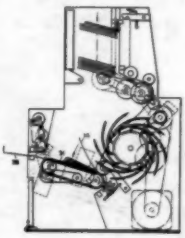
for slidably deforming said elastomeric layer, whereby relative motion in a predetermined range between the first and second objects can be damped and relative motion beyond said range toward or away from one another can be arrested.

4,964,517

PRINTED PAPER DISPENSING APPARATUS AND METHOD OF CONTROLLING SAID APPARATUS

Kenji Nishiumi; Toru Kassara; Yoshikazu Mori, and Eiji Itako, all of Saitama, Japan, assignors to Kabushiki Kaisha Nippon Conlux, Tokyo, Japan

Filed Mar. 24, 1989, Ser. No. 328,474
Claims priority, application Japan, Mar. 24, 1988, 63-70733; Mar. 24, 1988, 63-70734
Int. Cl.[5] B07C *5/342, 5/02*
U.S. Cl. 209—534 **19 Claims**



1. A method of controlling a printed paper dispensing apparatus comprising:

a first step of drawing printed papers in a printed paper receiving portion from the interior of the printed paper receiving portion one by one;

a second step of detecting an abnormality with the respective printed papers which have been drawn during said first step;

a third step of accumulating the printed papers which have been drawn during the first step so as to allow them to be placed one above another in a layered structure in an accumulating region;

a fourth step of conveying all the printed papers in said accumulating region to a dispensing outlet port after a predetermined period of time elapses after the printed papers have moved past abnormality detecting means, in a case where a predetermined number of printed papers are placed one above another in a layered structure in the accumulating region without an abnormality with the respective printed papers being detected during said second step; and

a fifth step of introducing printed papers in said accumulating region into an abnormal printed paper receiving portion after a predetermined period of time elapses after drawing of the printed papers from the printed paper receiving portion during the first step is interrupted, in a case where an abnormality is detected with the respective printed papers during the second step;

a sixth step of inching the printed papers in the accumulating region in the direction opposite to the dispensing outlet port before they are conveyed to the latter.

4,964,518

RECEPTACLE FOR COLLECTING AND BUNDLING NEWSPAPERS

William Wilson, 814 Jackson Ave., S. Plainfield, N.J. 07080

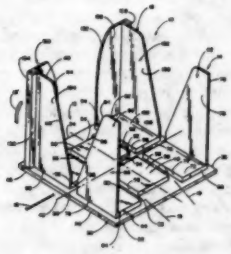
Filed Feb. 28, 1990, Ser. No. 485,487
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—50 **3 Claims**

1. A receptacle for stacking and binding loose newspapers into a bundle comprising:

(A) a base element which includes

(1) a bottom surface,

(2) a planar top surface,
(3) a front end, a rear end, a left side and a right side,
(4) a longitudinal centerline extending between said front end and said rear end, said front and rear ends being parallel to each other, and said right and left sides being parallel to each other, and
(5) a transverse centerline extending between said right side and said left side;
(B) a monolithic L-shaped right side front support element mounted on said base element and including
(1) a short leg fixedly mounted on said base element top surface between said base element transverse centerline and said base element front end, and including
(a) a front edge located adjacent to and spaced from said bake element front side, and extending parallel thereto,
(b) a rear edge located adjacent to and spaced from said base element transverse centerline
(c) an outside edge located adjacent to and spaced from said base element right side and being parallel thereto,
(d) an inside edge which is parallel to said outside edge,
(e) a planar top surface, and
(f) a thickness dimension measured between said short leg top surface and said base element top surface, and
(2) a long leg extending upwardly from said short leg and including
(a) a front edge extending upwardly from said base element top surface at a right angle thereto,



(b) a top edge extending from said long leg front edge towards said base element rear end parallel to said base element top surface,
(c) a rear edge first portion portion extending from said top edge toward said base element top surface at a skewed angle thereto,
(d) a rounded corner connecting said top edge to said rear edge first portion,
(e) a rear edge second portion extending from said rear edge first portion to said base element top surface and being oriented at a right angle to said base element top surface,
(f) an inside surface, and
(g) an outside surface;
(C) a monolithic L-shaped left side front support element mounted on said base element and including
(1) a short leg fixedly mounted on said base element top surface between said base element transverse centerline and said base element front end, and including
(a) a front edge located adjacent to and spaced from said base element front side, and extending parallel thereto,
(b) a rear edge located adjacent to and spaced from said base element transverse centerline,
(c) an outside edge located adjacent to and spaced from said base element left side and being parallel thereto,
(d) an inside edge which is parallel to said base element left side,
(e) a planar top surface which is co-planar with said right side support element short leg top surface, and
(f) a thickness dimension measured between said left side support element short leg top surface and said base element top surface, and
(2) a long leg extending upwardly from said left side support element short leg and including
(a) a front edge extending upwardly from said base element top surface at a right angle thereto,
(b) a top edge extending from said left side support element long leg front edge towards said base element rear end parallel to said base element top surface,
(c) a rear edge first portion extending from said left side support element top edge toward said base element top surface at a skewed angle thereto,
(d) a rounded corner connecting said left side support element top edge to said left side support element rear edge first portion,
(e) a rear edge second portion extending from said left side support element rear edge first portion to said base element top surface and being oriented at a right angle to said base element top surface,
(f) an inside surface, and
(g) an outside surface;
(D) a monolithic right side rear support element mounted on said base element top surface between said base element transverse centerline and said base element rear end and including
(1) a short leg fixed to said base element top surface and including
(a) an outside edge located adjacent to and spaced from said base element right side and extending parallel thereto,
(b) an inside edge extending parallel to said base element right side and being collinear with said right side front support element short leg inside edge,
(c) a front edge located adjacent to and spaced from said base element transverse centerline and extending parallel thereto,
(d) a rear edge located adjacent to and spaced from said base element rear end and being parallel thereto, and
(e) a top planar surface which is coplanar with said right side front support element short leg top surface,
(2) a web extending upwardly from said base element top surface at a right angle thereto and including
(a) a front edge first portion extending upwardly from said base element top surface at a right angle thereto and being spaced from said base element transverse centerline,
(b) a front edge second portion extending from said first portion towards said base element rear end at a skewed angle with respect to said base element top surface,
(c) a top edge extending from said web front edge second portion towards said base element rear end, and
(d) a rounded corner connecting said web top edge to said web front edge second portion,
(3) a cap portion on said web portion and including
(a) a linear edge located adjacent to said base element right side,
(b) an arcuate edge,
(c) a top edge connecting said arcuate edge to said linear edge, and
(d) a shoulder between said linear edge and said web;
(E) a monolithic left side rear support element mounted on said base element top surface between said base element transverse centerline and said base element rear end and including
(1) a short leg fixed to said base element top surface and including

(a) an outside edge located adjacent to and spaced from said base element left side and extending parallel thereto,
(b) an inside edge extending parallel to said base element left side and being collinear with said left side front support element short leg inside edge,
(c) a front edge located adjacent to and spaced from said base element transverse centerline and extending parallel thereto,
(d) a rear edge located adjacent to and spaced from said base element rear end and being parallel thereto, and
(e) a top planar surface which is coplanar with said left side front support element short leg top surface,

(2) a web extending upwardly from said base element top surface at a right angle thereto and including
(a) a front edge first portion extending upwardly from said base element top surface at a right angle thereto and being spaced from said base element transverse centerline,
(b) a front edge second portion extending from said left side rear support element first portion towards said base element rear end at a skewed angle with respect to said base element top surface,
(c) a top edge extending from said left side rear support element web front edge second portion towards said base element rear end, and
(d) a rounded corner connecting said left side rear support element web top edge to said left side rear support element web front edge second portion, and

(3) a cap portion on said left side rear support element web portion and including
(a) a linear edge located adjacent to said base element left side,
(b) an arcuate edge,
(c) a top edge connecting said left side rear support element arcuate edge to said left side rear support element linear edge, and
(d) a shoulder between said left side rear support element linear edge and said left side rear support element web;

(F) a monolithic front support pad mounted on said base element top surface between said base element front end and said base element transverse centerline and including
(1) a front edge located adjacent to and spaced from said base element front end and extending parallel thereto,
(2) a rear edge located adjacent to and spaced from said base element transverse centerline and extending parallel thereto and being aligned with said front side support element short leg rear edges,
(3) a left side edge located adjacent to and spaced from said left side front support element short leg inside edge and being parallel thereto,
(4) a right side edge located adjacent to and spaced from said right side front support element short leg inside edge and being parallel thereto, and
(5) a planar top surface which is co-planar with said front support element short leg top surfaces; and

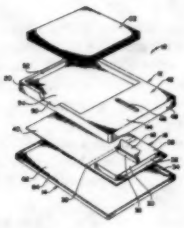
(G) a monolithic rear support pad mounted on said base element top surface between said base element rear end and said base element transverse centerline and including
(1) a front edge located adjacent to and spaced from said base element transverse centerline and extending parallel thereto and being collinear with said rear support element short leg front edges,
(2) a rear edge located adjacent to and spaced from said base element rear end and extending parallel thereto,
(3) a left side edge located adjacent to and spaced from said left side rear support element short leg inside edge and being parallel thereto and being collinear with said front support pad left side edge,
(4) a right side edge located adjacent to and spaced from said right side rear support element short leg inside edge and being parallel thereto and being collinear with said front support pad right side edge, and
(5) a planar top surface which is co-planar with said front pad top surface.

4,964,519

HOLDER FOR A DISPENSER FOR TAPE MARKER FLAGS

Louis Sugarman, Barrington, and Max B. Dressler, Warwick, both of R.I., assignors to Alcraft, Inc., Pawtucket, R.I.

Filed Apr. 13, 1989, Ser. No. 338,229
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—50 **7 Claims**



1. A holder for a dispenser for tape marker flags, wherein the dispenser includes a container portion having an enlarged body portion and an upwardly extending, open ended, tubular neck portion of elongated cross sectional length and reduced cross sectional width on said body portion, and a supply of tape marker flags in said body portion, said marker flags being individually dispensable through said neck portion, said holder comprising a housing which is adapted to be received and supported on a substantially horizontal supporting surface, said housing including a top wall portion having an elongated slot therein and a side wall portion depending from said top wall portion, said dispenser being removably receivable in a predetermined position in said housing wherein said neck portion extends upwardly through said slot, and means releasably retaining said dispenser in said predetermined position in said housing.

4,964,520

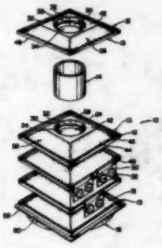
DISPLAY ASSEMBLY

John D. Kilmartin, III, Providence, R.I., assignor to International Packaging Corporation, Pawtucket, R.I.

Filed Aug. 7, 1989, Ser. No. 390,521
Int. Cl.[5] A47F 3/14
U.S. Cl. 211—131 **6 Claims**

1. A display assembly comprising a pair of tray members, and a support post for maintaining said tray members in vertically spaced relation, each of said tray members having top and bottom sides and including a support means for receiving and supporting an article for display thereon, and a central cylindrical tubular portion, each of said tubular portions comprising a main portion including inner and outer sides having inner and outer diameters, respectively, a terminal end portion including inner and outer sides having inner and outer diameters, respectively, and a shoulder portion therebetween; and outer diameters of the main portion of each of said tubular portions being greater than the inner and outer diameters, respectively, of the terminal end portion thereof, said support post beiag of elongated tubular cylindrical configuration and having inner and outer sides having substantially uniform inner and outer diameters, the inner diameter of the main portion of each of said tubular portions being substantially the same as the outer diameter of said support post, the outer diameter of the terminal and portion of each of said tubular portions being substantially the

same as the inner diameter of said support post; said support post having opposite first and second end portions, the outer side of the first end portion of said support post being received in engagement with the inner side of the main portion of the tubular portion of one of said tray members so that it abuts the shoulder portion thereof; the outer side of the terminal end



portion of the tubular portion of the other of said tray members being received in engagement with the inner side of the second end portion of said support post so that the second end portion of said support post abuts the shoulder portion of the tubular portion in which the second end portion is received for maintaining said tray members in vertically spaced relation.

4,964,521

AMPULS AND APPARATUS THEREON FOR OPENING SAME

Gerhard Wieland, Bensheim; Klaus Steckenreuter; Wolfgang Gernand, both of Darmstadt, and Helmut Simgen, Mehlingen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Mar. 13, 1989, Ser. No. 322,385

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1988, 3808308

Int. Cl.[5] B65D *51/22*

U.S. Cl. 215—32 **11 Claims**

1. An opening aid for ampuls (2) which are closed by plastic membranes (1), the opening aid being in the form of a sleeve (3) configured as a funnel, wherein the sleeve contains a membrane (4) welded to the plastic membrane (1).

4,964,522

THERMOPLASTIC BLOWN BOTTLE WITH A HANDLE

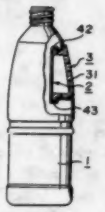
Yukihide Umetsu, Tokyo; Hideo Hasegawa, Hiratsuka; Toshio Takahashi, Hiratsuka, and Masayuki Miyagawa, Hiratsuka, all of Japan, assignors to Mitsubishi Plastics Industries Limited, Tokyo and Kikkoman Corporation, Noda, both of, Japan

Continuation of Ser. No. 186,238, Apr. 26, 1988, abandoned. This application Jul. 26, 1989, Ser. No. 384,918

Claims priority, application Japan, May 9, 1987, 62-122241; May 29, 1987, 62-83159; Jun. 9, 1987, 62-88867

Int. Cl.[5] B65D *23/10, 25/28*

U.S. Cl. 215—100 A **6 Claims**



1. A thermoplastic blown bottle with a handle, wherein said bottle comprises a bottle body with a concave portion, having a vertical surface parallel to the longitudinal axis of said bottle and having upper and lower attaching surfaces at its upper circumferential part and a handle attached to said concave portion, wherein said handle comprises:

an elongated gripping portion;

two fitting portions formed as part of said handle at each end of said gripping portion and which extend in a substantially parallel direction to each other and perpendicular to said gripping portion and placed in the same direction relative to said gripping portion so as to be in contact with said upper and lower attaching surfaces;

engaging projections formed as part of said fitting portions and on the portions of said fitting portions most distance from said gripping portion engaging with the innermost portion of the concave portion of said bottle body adjacent to the vertical surface; and

whereby the fitting portions reinforces the upper and lower attaching surfaces of said concave portion, of said bottle, and said vertical surface of the concave portion, in said bottle, reinforces the attachment of the engaging projections.

4,964,523

PARTITIONED TRASH RECEPTACLE WITH FLAT AND ARCUATE SIDES

Arnor Bieltvedt; Louay Jeroudi; Lena Andersson, and Sigurdur Agustsson, all of Providence, R.I., assignors to Johnson & Wales University, Providence, R.I.

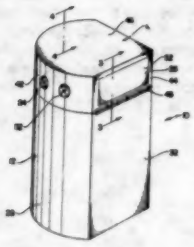
Filed Nov. 20, 1989, Ser. No. 445,807

Int. Cl.[5] B65D *25/04, 25/16*

U.S. Cl. 220—1 T **4 Claims**

1. A trash receptacle comprising a substantially upright container member having a substantially open upper end, partition means in said container member dividing it into first and second substantially upright compartments, said compartments having substantially open upper ends, and cover means on said container member, said cover means including first and second cover means sections which substantially cover the upper ends of said first and second compartments, respectively, said first and second cover means sections having first and second access openings therein, respectively, for passing trash into said first and second compartments, respectively, said container member including first and second upstanding substantially flat sidewall portions which are disposed in substantially perpendicular relation with respect to each other and an

arcuate upstanding sidewall portion extending between said first and second substantially flat upstanding sidewall portions, said arcuate sidewall portion defining the outer extremity of



said first substantially upright compartment, said first and second substantially flat sidewall portions defining the outer extremity of said second substantially upright compartment.

4,964,524

PRESSURE VESSEL FOR HYDROGEN STORAGE

Clemens Halene, Duesseldorf, Fed. Rep. of Germany, assignor to Gesellschaft fuer Hybrid und Wasserstofftechnik mbH, Muelheim/Ruhr, Fed. Rep. of Germany

Filed Dec. 5, 1988, Ser. No. 279,540

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1987, 3741625

Int. Cl.[5] B65D *90/02*

U.S. Cl. 220—3 **11 Claims**

1. Pressure vessel for the storage of hydrogen in form of metal hydride, comprising:

a first inner vessel tube with a cylindrical inner surface being relatively thin and/or made of material of high thermal conductivity, the strength of the inner vessel tube being insufficient by and in itself to take up operating pressure in the interior of the tube when hydrogen is either fed into the interior of the tube or developed therein;

an outer cylindrical tubular vessel jacket being made of high strength materials;

radially extending rib means on said inner vessel, to be extending towards enforced abutment with the inner wall of said outer jacket, without radially extending the inner surface of the vessel there being flow channels in-between the rib means on the outside not inside the tubes, said rib means dimensioned not undergo plastic deformation during operation at the gas storage facility;

axial end cap means for closing said inner vessel on both ends;

gas nipple means for feeding gas through at least one of said end cap means into and/or out of the interior of said inner vessel tube; and

sealing means for sealing the nipple relative to the axial end cap means.

4,964,525

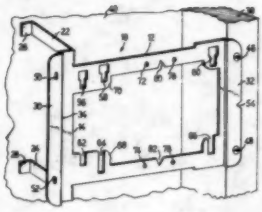
ELECTRICAL BOX MOUNTING BRACKET

Donald T. Coffey; Charles H. Oltz, both of Charlotte, N.C.; Donald D. Roth, and Richard J. Baran, both of Lorain, Ohio, assignors to G.B. Electrical Inc., Matthews, N.C.

Filed Sep. 21, 1989, Ser. No. 410,345

Int. Cl.[5] H02G *3/08*

U.S. Cl. 220—3.9 **8 Claims**



1. A mounting bracket for mounting a switch box to a wall stud within a wall having a pair of opposed wall panels, the switch box including a bottom, a peripheral sidewall extending therefrom to form a cavity, and a pair of threaded tabs, each including a mounting screw therein, extending from said sidewall parallel to said bottom, said bracket comprising:

a planar mounting panel including opposed first and second sections and opposed third and fourth sections connecting said first and second sections and therewith forming a central opening;

a pair of stabilizing legs each extending at a right angle from said planar mounting panel and each including a distal end for engaging an opposed wall panel;

mounting means including a threaded mounting hole in said third section and a threaded mounting hole in said fourth section for receiving the mounting screws of said box to secure said box to said mounting panel; and

bracket mounting means including a pair of spaced holes in said first section for receiving fasteners to secure said bracket to said stud.

4,964,526

CASE FOR FEMININE HYGIENE PRODUCTS

Chandra D. Stephens, P.O. Box 725082, Atlanta, Ga. 30339

Filed Aug. 1, 1989, Ser. No. 387,990

Int. Cl.[5] B65D *43/16*

U.S. Cl. 220—22 **14 Claims**

1. A case for feminine hygiene products comprising:

a substantially open, box-like bottom compartment having a bottom wall, a bottom-compartment front wall, a bottom-compartment rear wall, and bottom compartment end walls, said bottom wall, said bottom-compartment front wall, and said bottom-compartment rear wall extending to said bottom-compartment end walls forming ends of said substantially-open, box-like bottom compartment, said substantially-open, box-like bottom compartment also

having a box-like cover extending above each said end, respectively, said bottom-compartment front wall, said bottom-compartment rear wall, and said box-like covers defining a bottom-compartment opening;

a box-like top compartment having a top wall, a top-compartment front wall, a top-compartment rear wall, and a top-compartment end wall at each end thereof, said top-compartment front wall, said top-compartment rear wall and said top-compartment end walls defining a top-compartment opening slightly longitudinally shorter than but otherwise equal to said bottom-compartment opening, said top compartment having a depth equal to the distance which said box-like covers of said bottom compartment extend above said bottom-compartment front wall and said bottom-compartment rear wall;

a lower retaining plate;

an upper retaining plate;

means for removably positioning said upper retaining plate over said top-compartment opening;

means for removably positioning said lower retaining plate over said bottom-compartment opening; and

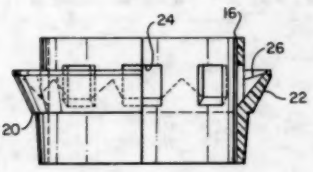
means for selectively positioning said top compartment over said bottom compartment with said top-compartment opening and said bottom-compartment opening facing each other.

4,964,527

PAINT SAVER AND CAN SEAL PROTECTOR

Harry W. Martin, 307 S. Smith Ave., #59, Corona, Calif. 91720

Filed Dec. 18, 1989, Ser. No. 451,592
Int. Cl.[5] B65D *25/48*
U.S. Cl. 220—90 **1 Claim**



1. An accessory used with a container for catching excess liquid from an applicator, draining the liquid back into the container, and protecting a container sealing groove, said accessory comprising:

a one piece round tube providing a brush wiping edge at a top open end of said tube,

a trough extending from an outside lip to a wall of said tube for catching excess liquid,

a plurality of rectangular shaped holes extending through said wall of said tube adjacent to said trough, and evenly spaced around the diameter and extending below the top end of said tube, said holes providing an exit for the excess liquid to drain from the trough back into the container,

a plurality of rib sections equally spaced inside and around said trough, and extending from said outside lip inward to said wall of said tube half-way between each of said plurality of rectangular holes, and angled downwardly to intersect with edges of said rectangular holes thereby accelerating the draining of excess liquid back into said container,

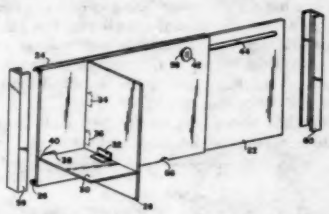
and two interrelated surfaces to locate said accessory within said container.

4,964,528

REMOVABLE AND ADJUSTABLE DIVIDER FOR COOLERS

Patrick K. Wagoner, Rte. 2, Box 276, Glen St. Marys, Fla. 32040

Filed Aug. 18, 1989, Ser. No. 395,755
Int. Cl.[5] B65D *5/48*
U.S. Cl. 220—22.3 **5 Claims**



1. A continuously adjustable partition, especially suitable for compartmentalization of a portable ice chest or cooler, comprising:

(a) a plurality of two larger rectangular panels;

(b) a plurality of two smaller rectangular panels;

(c) a slide hinge mechanism, enabling sliding movement of one of said two larger rectangular panels in a parallel plane, with respect to other of said two larger rectangular panels;

(d) a locking mechanism providing for the intermittent securement of said plurality of two larger rectangular panels, with respect to movement in said parallel planes;

(e) a plurality of hinges of the leaf type, enabling attachment of one of said two larger rectangular panels to a first of said two smaller rectangular panels and in addition, enabling attachment of said first of said two smaller rectangular panels to a second of said two smaller rectangular panels, whereby all of the larger and smaller rectangular panels are allowed to reorient thus resulting in a less voluminous arrangement.

4,964,529

GAS TANK CONTAINER

Robert S. Houston, 2390 Bowker Avenue, Victoria, Canada V8R 2E6

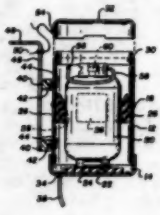
Filed Jun. 30, 1989, Ser. No. 373,750
Int. Cl.[5] B65D *25/18*
U.S. Cl. 220—402 **9 Claims**

1. Container to provide impact and corrosion protection for a high pressure gas tank, comprising a vertical cylindrical shell with bottom cap attached thereto, formed of resilient plastic non-combustible, corrosion resistent material, the inside diame-

ter of the shell being considerably greater than the outside diameter of the gas tank;

removable lid frictionally fitted to the top of the shell, adapted to lift off under internal pressure in the shell;

impact absorbing bottom pad on the inside of the bottom cap to support the gas tank;



at least one impact absorbing side pad of a thickness sufficient to extend between the shell and the gas tank to support the tank within the shell, with passage for gas to vent down from the top of the gas tank to the bottom cap of the shell, side brackets attached to said shell for vertical support of the container; and

gas vent in the bottom cap of the shell with flexible hose attached thereto, to vent gas out of the shell.

4,964,530

BOTTOM PANEL FOR CONTAINERS

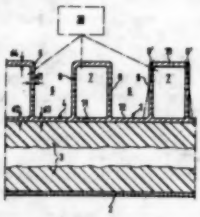
Wolfgang Graaff, Hildesheim, Fed. Rep. of Germany, assignor to Graaff Kommanditgesellschaft, Elze, Fed. Rep. of Germany

Filed Jan. 18, 1989, Ser. No. 298,418

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1988, 3801700

Int. Cl.[5] B65D *90/02, 6/34*

U.S. Cl. 220—442 **5 Claims**



1. A bottom panel for a container, comprising:

spaced apart upper and lower plates and a rigid foam between the plates,

hollow ribs projecting upwardly from the upper plate, each rib having a rectangular cross-section, the two longer sides of the rectangle being substantially perpendicular to the upper plate and one of the shorter sides of the rectangle being formed by the upper plate,

the ribs being spaced apart to define grooves between them, the bottom of each groove being defined by the upper plate and the top of each groove being open, whereby each groove will open into the container of which the bottom panel will form a part, the cross-sectional dimensions of the ribs and grooves being about equal,

the exposed corners where the two longer sides of each rib meet its shorter sides being rounded, and

the thickness of the upper shorter side of each rib being greater than the thickness of bottom plate portion forming the base of each groove, the latter being thicker than the bottom plate portion forming the lower shorter side of each rib, and the latter being thicker than each of the two longer sides of each rib.

4,964,531

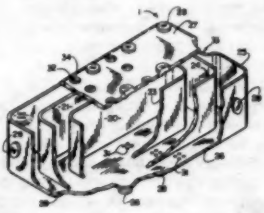
BLADDER FOR FUEL TANK

Joseph E. Caniglia, and Roberto G. Caniglia, both of 5368 E. 134th St., Garfield Heights, Ohio 44125

Filed Nov. 16, 1989, Ser. No. 437,675

Int. Cl.[5] B65D *90/00*

U.S. Cl. 220—855 **10 Claims**



10. A fuel tank system comprising a fuel tank having an interior volume defined by respective walls, and a bladder in the fuel tank, said bladder including means for forming plural concentric chambers separated by respective bladder walls, spacer means for spacing at least part of an outer wall of the bladder from an inner wall of the fuel tank, opening means for filling respective chambers from the bottom, and vent means for permitting air to exit the respective chambers.

4,964,532

OPEN TOP TANK HAVING A REMOVABLE AND SEALABLE LID WITH A FLOW RATE CONTROL DEVICE SUPPORTED THEREIN

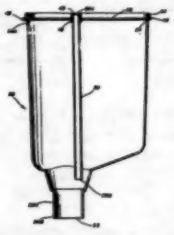
Jonathan Kirschner, Marietta, and William J. Saunders, Stone Mountain, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 738,432, May 28, 1985, abandoned. This application Sep. 13, 1985, Ser. No. 775,994

The portion of the term of this patent subsequent to Jun. 14, 2005, has been disclaimed.

Int. Cl.[5] B67D *3/00*

U.S. Cl. 222—1 **14 Claims**



1. A method for supplying syrup to a post-mix beverage dispenser at a controlled rate of flow comprising the steps of:

(a) providing a syrup tank including a container with a top end open to the atmosphere, a bottom end with a discharge opening therein and sidewalls connecting said top and bottom ends, said container having a rim around the top end defining a top opening;

(b) providing a flow rate control tube having a top open end adjacent the top opening of said container and a bottom open end disposed at a predetermined distance above said

discharge opening, said tube establishing atmospheric pressure at said bottom open end thereof, and a removable lid of thin, flexible plastic having a sealing means for forming a hermetic seal between the lid and said rim around the top opening and a socket integrally formed with said removable lid for supporting said flow rate control tube within said container;

(c) connecting said discharge end of said container with a dispensing valve mechanism of said post-mix beverage dispenser;

(d) removing the lid from said tank;

(e) filling said tank with syrup through the top opening of said container;

(f) replacing the lid on said tank; and

(g) actuating said dispenser valve mechanism to cause said syrup to be dispensed therethrough.

5. An apparatus for dispensing liquids with a controlled rate of flow comprising:

a container with an open top end, a bottom end with a discharge opening therein and sidewalls connecting said top and bottom ends, said container having a rim for defining said open top end;

a flow rate control tube having a top open end adjacent the open top end of said container and an open bottom end disposed at a predetermined distance directly above said discharge opening, said tube establishing atmospheric pressure at said open bottom end thereof; and

a removable lid of thin, flexible plastic having sealing means for forming a hermetic seal between the lid and said rim defining said open top end, said lid being removable for refilling purposes; and

means, provided in said removable lid, for supporting said flow rate control tube within said container wherein said means for supporting includes a socket integrally formed with said removable lid, for receiving and supporting the top open end of said flow rate control tube, said socket having an aperture therein for communication with the atmosphere and said top open end of said tube.

4,964,533

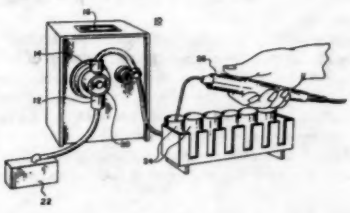
PUMPING SYSTEM

Robert W. Allington; Jon L. Curran, and Jerold B. Schmidt, all of Lincoln, Nebr., assignors to Isco, Inc., Lincoln, Nebr.

Filed Mar. 18, 1985, Ser. No. 713,328

Int. Cl.[5] B67D *5/08*

U.S. Cl. 222—14 6 Claims



1. Apparatus comprising:

a reciprocating positive displacement pumping system having a piston and a cylinder with said piston being capable of a predetermined full displacement stroke length;

a source of rotary power;

transmission means for actuating said positive displacement pumping system in response to said source of rotary power;

said transmission means including adjustable means for controlling the stroke length of said piston during a reciprocation between a said full displacement stroke length and a substantially shorter stroke length;

said apparatus including a movable element the motion of which has a nonlinear relationship with the volume of fluid pumped by said positive displacement pump;

circuit means for sensing and encoding the position of said element;

said circuit means including sensing means for sensing the position of said element, and encoding means for converting said nonlinear relationship to a linear relationship with volume of fluid pumped;

input means for setting a volume of fluid to be displaced by said pump;

control means for causing the volume of fluid displaced to equal the volume set into said input means;

said encoding means including means for generating at least one signal for each increment of linear motion of said piston in a piston stroke, which increment is equal to no more than one-third of the linear motion of said piston;

said means for generating at least one signal including means for generating at least one electrical signal for each portion of a cycle of the pump equal to more than one-third of the product of the linear motion of said piston in a piston stroke and the cross-sectional area of said cylinder divided by the total displacement volume of the pump;

said control means includes means for comparing said input signal with said signals generated for each increment and terminating the motion of said motor when said two are equal;

said element having a nonlinear relationship is the shaft of said source of rotary power;

said element including a disk mounted for rotation with said shaft and said encoding means including indicia upon said disk in a predetermined pattern and means for sensing said indicia as said disk rotates; and

said encoding means including means for generating signals representing increments of volume pumped corresponding to said indicia.

4,964,534

DOUBLE PISTON COLORANT DISPENSER

Atis Strazdins, Unanderra, Australia, assignor to Strazdins (International) Pty. Limited, Sydney, Australia

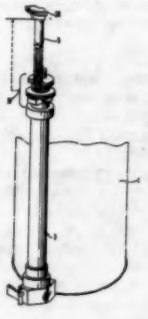
Filed Jun. 24, 1988, Ser. No. 210,862

Claims priority, application Australia, Jun. 24, 1987, PI2662

The portion of the term of this patent subsequent to Oct. 30, 2007, has been disclaimed.

Int. Cl.[5] B67D *5/08*; G01F *11/04*

U.S. Cl. 222—43 4 Claims



1. A liquid dispenser comprising;

a housing;

an inlet to the housing;

an outlet from said housing;

a valve operably connected to said housing and being operable such that whenever in a first position said inlet is opened while at the same time said outlet is closed and whenever in a second position said inlet is closed while at the same time said outlet is opened;

a first variable stroke piston, moveable within said housing, so as to draw liquid into said housing when said valve is in its first position and to force liquid out of said housing when said valve is in its second position;

a bore located within said first piston;

a second variable stroke piston moveable along said bore with or independently of said first piston and can draw liquid into said bore when moved independently of said first piston and said valve is in its first position and to force liquid in said bore out of said outlet of said housing when said valve is in its second position,

said housing is generally tubular with a first adjustable gauge extending into said housing and adapted to be set such that reproducible qualities of liquid can be dispensed from said housing and a second adjustable gauge extending into said housing such that reproducible qualities of liquid of smaller quantities then the first quantities of liquid, can be discharged by said second piston.

4,964,535

DISPENSING APPARATUS

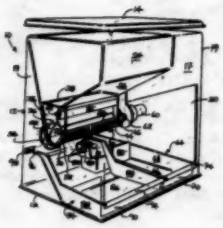
Neil W. Curwen, 18 Andante Street, Falcon, South Mandurah, Western Australia, 6210, Australia

Filed Jun. 16, 1989, Ser. No. 367,765

Claims priority, application Australia, Jun. 17, 1988, PI8830

Int. Cl.[5] G01F *11/10*

U.S. Cl. 222—67 **10 Claims**



1. A dispensing apparatus for dispensing particulate material, the dispensing apparatus comprising:

(a) a hopper dimensioned to retain a store of the particulate material, the hopper having an outlet located at its lower end;

(b) a metering chamber connected to said outlet of the hopper, said metering chamber having curved fingers, a tumbler journalled upon said curved fingers, a flap resiliently bearing against said tumbler to maintain same journalled upon said curved fingers, said metering chamber also having an outlet;

(c) said tumbler having a cylindrical body formed with two end disks, two substantially parallel longitudinal sides located between said end disks, a base located between said longitudinal sides, a longitudinal cavity defined by said end disks, said longitudinal sides, and said base; a plurality of fins radiating in substantially mutually parallel manner outwardly from each of said longitudinal sides, said fins being spaced apart such that adjacent ones of said fins inhibit passage of said particulate material therepassed, free ends of said fins being disposed to meet said flap during rotation of said tumbler;

said tumbler being rotatable from a location whereat said longitudinal cavity of said tumbler is disposed toward said outlet of the hopper for filling with said particulate material and to a location whereat said longitudinal cavity of said tumbler is disposed toward said outlet of the metering chamber for dispensing of said particulate material.

4,964,536

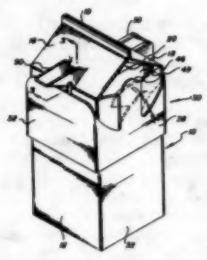
CARTON HOLDING AND POURING DEVICE

Gerardus B. A. Vestering, 1720 Gore Road, London, Ontario, Canada

Filed Oct. 20, 1988, Ser. No. 260,093

Int. Cl.[5] B65D *23/10*

U.S. Cl. 222—83 **7 Claims**



1. A carton holding and pouring device for a carton having a pair of side panels and a pair of end panels with an upper part of each end panel folded under an upper part of both side panels to provide an inclined triangular surface in a recess at each end of a sealed top of the carton comprising:

a rectangular frame having a pair of side walls and a pair of end walls dimensioned to slidably receive said side panels and said end panels of said carton,

each of said end walls of said frame including an upwardly extending arm and a clamp plate on each of said upwardly extending arms,

each of said clamp plates projecting upwardly and inwardly for surface contact with one of said triangular surfaces at one end of the sealed top of said carton,

at least one of said upwardly extending arms formed to incline toward the other upwardly extending arm at an angle to bias the clamp plate on that arm toward the other upwardly extending arm while providing sufficient flexibility to withdraw said clamp plate against said bias,

a pouring spout on one of said side walls of said frame and adapted to puncture an upper part of one of said side panels, and

means for manually grasping said rectangular frame,

whereby said upwardly extending arms on each of said end walls may be expanded to permit said rectangular frame to slide over the sealed top of said carton and released to engage said clamp plates in said recesses and said upper part of one of said side panels may be punctured by said spout with said clamp plates contacting said triangular surfaces and securing said rectangular frame to said carton.

4,964,537

PLASTIC CAP ASSEMBLY HAVING A CENTRAL SEALING PIN

Werner F. Dubach, Maur, Switzerland, assignor to Alfatechnic AG, Switzerland

Filed Jun. 14, 1988, Ser. No. 206,589

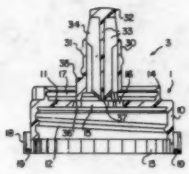
Claims priority, application Switzerland, Jun. 16, 1987, 2285/87

Int. Cl.[5] B67D *5/00*

U.S. Cl. 222—83 **7 Claims**

1. A plastic cap assembly comprising: a base cap (1) that can be installed on a neck (H) of a container, said base cap (1) having an outlet (15) and a pour spout (3) that is connected

thereto and closed at one end, said pour spout serving as a sealing pin, a screw cap (2) rotatably connected with said base cap (1), said screw cap having a central opening (22), in a closed position, the upper closed end of said pour spout (3) protrudes within said central opening 922) forming a seal, said pour spout (3) being shaped as a pipe section (30) and being supported in said base cap (1) so as to be movable upwards and downwards in an axial direction and be secured against rotating, said pour spout (3) tapering conically toward an end in an upper area beneath the closed end (32) and having lateral outlet openings (34); and wherein said pour spout (3) has an outside thread (31) mateable with an inside thread (24) in at



least one wall section (23, 29) rigidly connected to said screw cap (2) beneath said central opening 922) and which encloses said pour spout (3), a central spike-like penetrator (37) mounted within said pipe section (30) with diametrical walls (33), a lower end of said pipe section (30) having guide radial ribs (35) interacting with corresponding recesses (16) within said outlet (15), and said screw cap (2) having an annular cap wall (25) displaced toward an outer peripheral casing wall (10) of said base cap (1), one of an annular base wall (14) and said annular cap wall (25) having an annular groove (17) and the other of said annular base wall (14) and said annular cap wall (25) having an annular bead (26) whereby in a use position said annular bead (26) is mated within said annular groove (17).

4,964,538

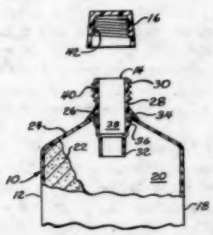
PACKAGE FOR FLOWABLE MATERIAL

Alan Nimmey, Sale, and Harry Hayes, Warrington, both of England, assignors to Colgate-Palmolive Company, Piscataway, N.J.

Continuation of Ser. No. 221,668, Jul. 20, 1988, abandoned. This application Feb. 2, 1990, Ser. No. 473,898

Int. Cl.[5] B65D *35/06*

U.S. Cl. 222—92 **11 Claims**



1. A package for a flowable material, comprising:

an elongated collapsible tube having a wall defining a chamber to receive the material, said tube having a tapered shoulder of one-piece construction with said wall and defining a forward portion of said chamber substantially across the chamber such that the material contacts said shoulder, with said shoulder being directed forwardly of said wall and having a generally central opening; and

a separate insert comprising a hollow tubular section received in the opening, said tubular section having an outer end portion located outside of the shoulder, and an inner end portion having substantially the same dimensions as the outer end portion and extending into the chamber to a location past the shoulder a sufficient distance to prevent extrusion of the material in the region of the shoulder through the tubular section, said shoulder and insert defining at their juncture an inwardly tapered and narrowing space of said chamber to direct said material forwardly along the shoulder and capture the material intermediate the shoulder and insert, and means for sealingly engaging the shoulder around the opening.

4,964,539

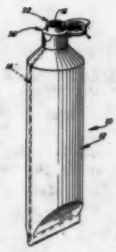
MULTIPLE CHAMBER DISPENSING CONTAINER AND CLOSURE SYSTEM

Bruce M. Mueller, Crystal Lake, Ill., assignor to Seaquist Closures, Crystal Lake, Ill.

Filed Apr. 6, 1989, Ser. No. 334,071

Int. Cl.[5] B65D *35/22*

U.S. Cl. 222—94 **20 Claims**



1. A package for dispensing at least two substances simultaneously in an adjacent relationship, said package comprising:

a container;

divider means for internally dividing the interior volume of said container into a plurality of separated storage compartments;

said container having an outlet end with a peripheral annular outlet wall defining wall defining a discharge aperture communicating with said compartments, said outlet wall having a cylindrical exterior peripheral sealing surface, and said outlet wall having interior peripheral sealing surfaces;

said divide means including at least one divider wall projecting within said discharge aperture, each said divider wall extending to said peripheral annular outlet wall to define, in cooperation with said outlet wall interior peripheral sealing surfaces, a plurality of discharge passages each communicating with a respective one of said compartments, each said divider wall having generally oppositely facing sealing surfaces that each define a portion of the inner periphery of a respective one of said discharge passages, the cooperative arrangement of each said divider wall and said outlet wall providing each said discharge passage with (1) one of said interior peripheral sealing surfaces in the form of a partially cylindrical surface and (2) at least one planar sealing surface defined by said divide wall whereby said discharge passage has a transverse cross-sectional flow area in the form of a sector of a circle; and

a cover for securement to said container over said outlet end, said cover including (1) a downwardly projecting peripheral seal member having an interior cylindrical sealing surface for sealing against said exterior peripheral sealing surface of said container outlet wall, and (2) a plurality of downwardly projecting interior seal members, each said interior seal member including a planar seal wall and a

partially cylindrical seal wall which together have a perimeter with a transverse cross-sectional shape in the form of a sector of a circle generally congruent to the flow area of the sector of one of said discharge passages, said interior seal members being arranged with the partially cylindrical seal walls located on the locus of a circle and with each said planar wall of one of said seal members being parallel to, but spaced from, a planar wall of another of said seal members whereby, when said cover is secured to said container over said outlet end, said seal members project into a respective one of said discharge passages to seal against the sealing surfaces of the outlet wall and each divider wall that define the inner periphery of said respective one discharge passage.

4,964,540

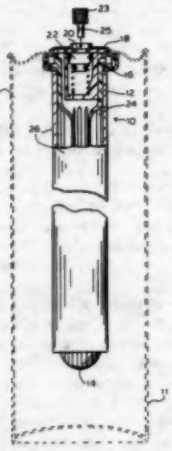
PRESSURIZED FLUID DISPENSER AND METHOD OF MAKING THE SAME

Hyman Katz, Somerset, N.J., assignor to Exxel Container, Inc., Somerset, N.J.

Continuation of Ser. No. 661,583, Oct. 17, 1984, abandoned. This application Nov. 13, 1989, Ser. No. 434,488

Int. Cl.[5] B65D *35/28*

U.S. Cl. 222—95 **10 Claims**



1. An apparatus for containing and dispensing a pressurized fluid, comprising:

an expandable bag having a generally cylindrical shaped outer wall, said bag having a closed end and an open end, said outer wall including a plurality of substantially longitudinal pleats, said pleats defining a plurality of peaks and valleys;

valve means coupled with said open end for selectively releasing the contents of the bag;

an expandable energy tube substantially surrounding said bag for maintaining pressure on the bag and its contents;

a plurality of expandable longitudinal ribs disposed in said valleys of said pleats and at least partially filing said valleys, said longitudinal ribs controlling refolding of the pleats in the bag as fluid is released from the bag.

4,964,541

DISPENSING DEVICE FOR MIXING AN ADDITIVE

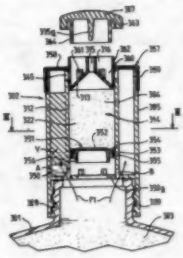
Jean-Louis Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Mar. 28, 1989, Ser. No. 329,763

Claims priority, application France, Mar. 28, 1988, 88 04022

Int. Cl.[5] B67D *5/60*

U.S. Cl. 222—137 **9 Claims**



1. A dispensing device for cooperation with a container of the type having an outlet opening, said device serving as a removable cap for the container and dispensing an additive with the contents of the container in a mixture of a pasty substance such as in the form of a stripped strand, said device including means for mounting said device on the outlet opening to close the opening, said device comprising:

an integrally molded cap having an inlet end and an outlet end, the inlet end fitting on the outlet opening of the container, the cap including:

a cylindrical wall defining a central channel and having lateral passages provided in a first portion thereof adjacent said inlet end and openings in a second portion thereof adjacent said outlet end, said cylindrical wall defining at least in part a reservoir for the additive;

an outer casing defining an annular space between an outer surface of said cylindrical wall and an inner surface of said casing; and

a transverse wall that connects said first portion of the cylindrical wall with the outer casing;

an integrally formed dispenser spout rotatably mounted on the outlet end of the cap and including:

a ring forming said spout and having an edge joined to a flange fitting on said outer casing; and

a cylindrical member connected to an inner surface of said cylindrical wall, said cylindrical member having openings therein, the openings in said cylindrical member being rotatable with said spout so as to vary the extent to which the openings are covered in the second portion of the cylindrical wall, thus allowing variation of a proportion of said pasty substance relative to the additive; and

a piston slidably disposed in the reservoir, said piston moving in response to dispensing of contents from the container so as to dispense the additive from the reservoir while separately maintaining the contents of the container from the additive.

4,964,542

FROZEN BEVERAGE DISPENSER

Dell W. Smith, Los Angeles, Calif., assignor to Bar-Master International, Los Angeles, Calif.

Filed Nov. 14, 1988, Ser. No. 270,539

Int. Cl.[5] B65D *88/54*

U.S. Cl. 222—146.6 **13 Claims**

1. In a frozen beverage dispenser for use with a liquid/ice slurry machine having freezing means for freezing a liquid to form a slurry and circulating means for circulating the liquid

through the freezing means, the improvement comprising in combination:

inner and outer concentric tubes forming a flexible line;

a nozzle;

first means for connecting said line to said nozzle; and

second means for connecting said line to said machine to provide a slurry recirculating path between said circulating means and said nozzle;

aid nozzle including:

a housing with a flow path therethrough between an inlet and an outlet;

means for connecting said outer tube to said housing;

means for connecting said inner tube to said housing in communication with said flow path;

valve means in said flow path for controlling flow through said outlet; and

bypass means in said housing for providing flow from said inner tube to said outer tube; and

said bypass means including a sleeve carried in said housing in said flow path, with said inner tube connected to said sleeve, and with said sleeve having at least one lateral opening providing communication with said outer tube.

4,964,543

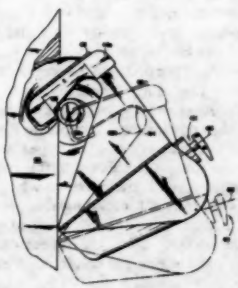
FLUID DISPENSER

John G. Scheiber, 4252 N. Range Line Rd., Huntington, Ind. 46750

Continuation of Ser. No. 2,456, Jan. 12, 1987, Pat. No. 4,798,312. This application Sep. 13, 1988, Ser. No. 244,151

Int. Cl.[5] B67D *5/06*

U.S. Cl. 222—180 **28 Claims**



1. A fluid dispensing device suitable for attachment to a paper roll dispenser comprising:

fluid container means;

suspending means attached to said fluid container means to suspend said fluid container means from the paper roll dispenser, wherein said suspending means includes a first arm and a second arm, said first arm having a first upper end, said second arm having a second upper end, wherein said first upper end is spaced a distance from said second upper end, said distance being greater than the width of the paper roll to be dispensed by the paper roll dispenser to allow said first arm and said second arm to hang on each side of the paper roll, wherein said first upper end and said second upper end each have a rearwardly elongated arm member having a rearward reach greater than one inch and defining a forward spindle stop and a rearward spindle stop thereunder for engaging paper roll dispensers in at least two distinct suspended positions corresponding to distinct locations of a paper roll spindle with respect to a wall supporting the paper roll dispenser; and

fluid dispenser means arranged to pump fluid from said container means.

4,964,544

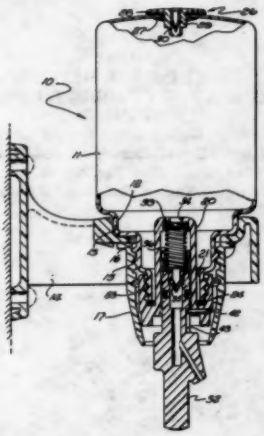
PUSH UP DISPENSER WITH CAPSULE VALVE

Emmanuel A. Hanna, Lakeview Terrace, and Henry J. Loewenthal, Santa Monica, both of Calif., assignors to Bobrick Washroom Equipment, Inc., North Hollywood, Calif.

Filed Aug. 16, 1988, Ser. No. 232,679

Int. Cl.[5] B67D *5/06, 5/40*

U.S. Cl. 222—181 **12 Claims**



1. In a push up fluid dispenser having a fluid storage container and a vertically oriented plunger carried in said container, with said plunger being manually pushable upward for dispensing fluid from said container, the improvement comprising in combination:

a valve cylinder including means for mounting said cylinder in said container, said cylinder having an upper opening and an interior passage for slidingly receiving said plunger,

said means for mounting including interengaging means for joining said cylinder to said container for support of said cylinder on said container and movement of said cylinder with said container, and seal means for fluid sealing between said cylinder and container,

with said plunger having a fluid flow passage therein providing a flow path from the interior of said cylinder to the exterior of said dispenser;

first and second one-way valves, with said first one-way valve being a head holding valve and disposed for control of fluid flow into said interior of said cylinder through said upper opening and with said second one-way valve disposed for control of fluid flow from said interior into said plunger passage;

spring means engaging said cylinder and plunger urging said plunger downward away from said cylinder upper opening;

said cylinder and plunger having interengaging stop means for limiting downward movement of said plunger.

with an upward force on said plunger moving said plunger upward compressing said spring means and forcing fluid from said interior of said cylinder out said plunger passage through said second one-way valve, and with said spring means moving said plunger downward drawing fluid from said container into said interior of said cylinder through said upper opening and first one-way valve, and

with said first one-way head holding valve blocking fluid flow through said upper opening at all times except when said plunger is moving downward and drawing fluid from said container through said upper opening; and

a sliding seal between said plunger and cylinder,

with said plunger having an upper end positioned within said cylinder above said seal and said stop means and with said second one-way valve carried at said plunger upper end.

4,964,545

MULTIPATH MACHINE FOR METERING, FILLING AND PACKING A PASTY PRODUCT, ESPECIALLY A SOUP PASTE

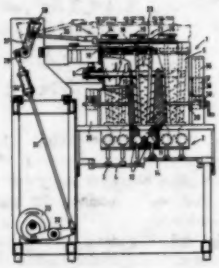
Alfred Mooshammer, Ratingen, Fed. Rep. of Germany, assignor to Benz & Hilgers GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 6, 1989, Ser. No. 307,362

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1988, 3803677

Int. Cl.[5] G01F *11/00*

U.S. Cl. 222—271 **15 Claims**



1. In a multipath machine for metering, filling and packing a pasty product, especially a soup paste, in more than two product rows with a feed mechanism having a conveying trough with at least one conveyor screw and a following metering mechanism with a mouthpiece associated with one of said product rows, the improvement wherein

at least one of said conveyor screws is associated with each of said product rows,

a common entrance funnel is provided for all of said product rows,

a distributing screw is mounted inside said entrance funnel, extends substantially across said entrance funnel, and is situated adjacent and perpendicular to said conveyor screws,

pairs of said conveyor screws extend toward a single respective pressing chamber of said metering mechanism and two adjacent product rows are fed through the respective pressing chamber.

4,964,546

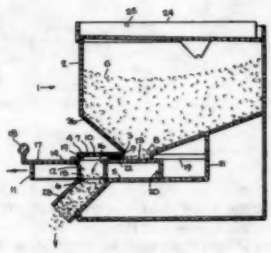
MEASURED QUANTITY DISPENSER

Lester Morrow, Ossining, and R. Christopher Kidd, New York, both of N.Y., assignors to Marlboro Marketing, Inc., New York, N.Y.

Continuation of Ser. No. 218,314, Jul. 12, 1988, abandoned. This application Sep. 15, 1989, Ser. No. 425,348

Int. Cl.[5] G01F *11/10*

U.S. Cl. 222—352 **12 Claims**



1. Measured quantity dispenser for flowable solids material such as frangible granules, which comprises

a housing having a lower slide surface containing a front discharge opening, and an upper portion containing a rear loading aperture above the slide surface and rearwardly of the opening and provided with a front edge, the aperture being adapted for intake of solids material from an overlying source, said upper portion of the housing having an upper wall with an underside extending forwardly from the aperture front edge and overlying the slide surface,

a receptacle disposed in the housing for movement between a rearward loading position and a forward discharge position, and containing a forward measuring bin and a rearward upper slide platform, the bin having an upper open entrance at a level adjacent the aperture and a lower open exit at a level adjacent the slide surface, the bin being of selective volume for receiving and dispensing a predetermined measured quantity of solids material, the entrance of the bin being provided with a rear edge and the platform extending rearwardly from the rear edge, the entrance of the bin being further provided with an entrance front edge portion and a receptacle forward platform portion extending forwardly from said entrance front edge portion and located at a level below said aperture front edge portion, said receptacle forward platform portion and said underside of the upper wall of the housing forming a space therebetween, the entrance being in operative registry with the aperture when the receptacle is in rearward position for loading solids material into the bin from the source, and the exit being in operative registry with the opening when the receptacle is in forward position for discharging the solids material from the bin, and

resilient leveling means disposed in the space formed by the receptacle forward platform portion and the entrance front edge portion with the underside of the upper wall of the housing adjacent the aperture front edge and arranged in immediate underlying relation to the aperture front edge and in immediate overlying relation to the entrance and platform for cooperation with the entrance and platform to prevent overlying solids material in the aperture from moving forwardly in the housing between the leveling means and platform and from being sheared or jammed between the aperture front edge and entrance rear edge, during receptacle forward movement with the solids material at the exit sliding on the slide surface, and with the platform sliding against overlying solids material in the aperture, for discharge of the bin loaded solids

material from the exit through the opening when the receptacle reaches the forward position.

4,964,547

MANUALLY-OPERATED PRECOMPRESSION TYPE SPRAY HEAD

Jean P. Lina, Le Neubourg, France, assignor to Valois (Societe Anonyme), LePrievre, France

Filed Sep. 9, 1988, Ser. No. 242,462
Claims priority, application France, Sep. 9, 1987, 87 12496
Int. Cl.[5] B65D *83/14*
U.S. Cl. 222—385 **4 Claims**

1. A spray head for use with a receptacle containing a liquid which is maintained under pressure by a propellant gas, thereby enabling a product to be packaged so that it is protected from coming into contact with the air, said spray head being of the type comprising a manually-operated precompression pump which includes a pump chamber comprising first and second cylinders capable of engaging telescopically, said chamber being closed by relative displacement of said cylinders, said first cylinder being integral with a pump outlet valve and being provided at one of its ends with a circular sealing lip capable of engaging against and of sliding along the wall of said second cylinder, which second cylinder is in communication with the inside of said receptacle, said wall being provided with a relief constituted by grooves or notches formed on that end of said second cylinder which is furthest from said receptacle, said notches having a length of not less than 1.5 mm, so that when said sealing lip lies over said relief, said relief causes sealing to be broken, opening a passage suitable for passing said propellant gas at a rate of flow which is sufficient for filling said receptacle.

4,964,548

DISPENSING CLOSURE HAVING AN INTERIOR SEALING SLEEVE, A THREADED SLEEVE ENGAGING A THREADED TUBE, AND STOP BLOCKS LIMITING TWISTING OF THE CLOSURE CAP

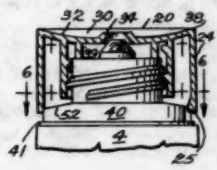
William B. Kenyon, Jr., Easthampton, Mass., assignor to McCormick & Company, Inc., Hunt Valley, Md.

Continuation of Ser. No. 181,070, Apr. 13, 1988, abandoned. This application Oct. 27, 1989, Ser. No. 427,993
Int. Cl.[5] B65D *47/28, 55/08*
U.S. Cl. 222—521 **3 Claims**

1. A dispensing device for dispensing a tubed product, comprising:

a cap having a cup shape with a concave end wall and an integral peripherally located side wall, said concave end wall including a centrally located exterior valve element, said cap also having a first interior sleeve, with a single continuous thread located on an interior surface thereof, depending from said concave end wall and a second sleeve located interiorly of said first interior sleeve, said second sleeve having a smaller axial dimension than said first sleeve; and

a tube end portion having an end wall with passages located therein and an upstanding exteriorly double threaded sleeve formed integrally therewith, said double threaded sleeve comprising a tubular member including an internal cylindrical surface having a selected axial extent, said tube end wall also having an upstanding centrally located tapered valve stem extending therefrom, said second sleeve of said cap comprising a tubular surface portion with said tubular surface portion being dimensioned to sealingly engage said internal cylindrical surface of said double threaded sleeve of said tube end portion over a substantial portion of said selected axial extent for all positions of said cap relative to said tube end portion, said tube end portion being dimensioned to telescopically fit within the cap, said cap interior sleeve thread and said tube end portion upstanding double threaded sleeve portion cooperating in a manner so as to provide relative axial displacement between said cap and said tube end portion when said cap is twisted relative to said tube end portion, said valve stem and said valve element cooperating to seal and unseal said dispensing closure upon the occurrence of axial displacement therebetween, the respective limits of axial displacement being a closed and a most open position



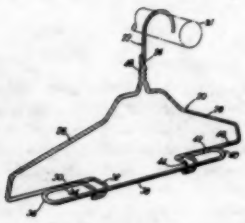
for the dispensing closure; said tube end portion further including a shoulder and a side wall extending axially from said shoulder with said side wall of said tube end portion having an axial dimension less than that of said double threaded sleeve, said side wall of said tube end portion having at least one first stop block means disposed thereon and said side wall of said cap having at least one second stop block means formed thereon for cooperation with said first stop block means, the two stop blocks means limiting the twisting of said cap relative to said tube end portion between said closed to said most open positions for the dispensing device, said shoulder of said tube end portion cooperating with a bottom edge portion of said side wall of said cap to limit twisting of said cap relative to said tube end portion from said most open to said closed position, said thread of said first interior sleeve reminding in contact with said double threaded sleeve of said tube end portion for all positions of said cap and tube end portion;

said concave end wall of said cap being sufficiently concave such that a peripheral rim of said cap extends axially beyond said exterior valve element, the dispensing device being capable of being stored on said end wall of said cap so that the tubed product will be pulled by gravity toward said end wall of said tube when it is so stored.

4,964,549
TWO PIECE TORSO DISPLAY DEVICE FOR STOCKINGS
Kerstein Schwab, Gwand ia, 7245 Starzach, Fed. Rep. of Germany
Filed Mar. 30, 1989, Ser. No. 330,437
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1988, 8804402
Int. Cl.[5] A47F 7/19, 7/10, 7/00, 8/00
U.S. Cl. 223—66 10 Claims

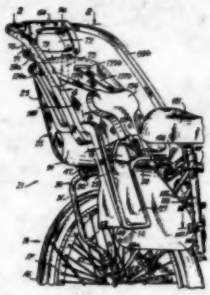
1. A device for displaying panty hose, comprising a hollow body comprising front and back portions having outer surfaces contoured to simulate a human trunk and abdomen for being fitted with a pair of panty hose, each of said front and back portions also including peripheral edge portions which meet and form sides of said device, said sides being of reduced dimension relative to a human body so that the distance between the outer surfaces of said front and back portions is less than the depth of a human trunk and abdomen.

4,964,550
LOCKING GARMENT HANGER
Larry M. Balkin, 2690 Valleydale Dr., Conyers, Ga.
Division of Ser. No. 170,763, Mar. 21, 1988, Pat. No. 4,852,777.
This application Mar. 21, 1989, Ser. No. 326,323
Int. Cl.[5] A47G 25/52
U.S. Cl. 223—91 12 Claims



1. A locking garment hanger comprising a length of wire formed into a generally triangular form having a hook means extending from an upper end of said triangular form for suspending said hanger from a suitable support, arm means extending angularly downward from both right and left sides of said hook means for supporting arm portions of a garment, and a lower garment supporting rod member formed as a continuation of said arm members, said rod member having first and second sides and having a first portion extending transversely relative to said arm means and disposed in a first vertical plane and a second portion formed into at least one garment retaining clip means having a generally vertical portion, said vertical portion being disposed in a plane parallel to said first plane when in a resting position and being spaced from said first side of said rod member, said clip means being laterally displaceable to said second side of said rod member for engaging and securing a garment disposed on said rod member.

4,964,551
BICYCLE CHILD CARRIER ASSEMBLY
Robert O'Donovan, Wantagh, and Robert Ippolito, Massapequa Park, both of N.Y., assignors to Cycle Products Company, Commack, N.Y.
Filed Mar. 28, 1989, Ser. No. 329,479
Int. Cl.[5] B62J 7/04
U.S. Cl. 224—32 A 28 Claims



5. For a bicycle having a seat, a front wheel and a rear wheel, and a frame including a seat bar for supporting said seat and a pair of down bars extending from said seat bar to said rear wheel on either side thereof, a child carrier assembly comprising:

a seating assembly for retaining a child;

a frame assembly adapted for supporting said seating assembly on said bicycle substantially behind said bicycle seat;

wherein said frame assembly includes a seating assembly supporting frame having a latch bracket disposed underneath and connected to said seating assembly;

wherein said frame assembly further includes a bracket assembly releasably connectable to said latch bracket of said seating assembly supporting frame;

wherein said bracket assembly includes a seat bracket adapted for coupling to said seat bar and an adjustment bracket selectively connectable to said seat bracket;

wherein said adjustment bracket is selectively connectable to said seat bracket at a plurality of locations thereon to enable said carrier assembly to be mounted on bicycles of various sizes;

wherein said latch bracket includes a forward tongue and said adjustment bracket includes a slot for selectively receiving the tongue of the latch bracket; and

said bracket assembly including a first opening and said latch bracket including a second opening, said second opening adapted for alignment with the first opening for selectively retaining a connecting member therethrough when said tongue is received in said slot and said carrier assembly is mounted on the bicycle.

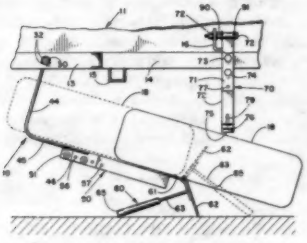
4,964,552
TIRE HOLDER
Carl J. Terwilliger, Rte. 5, Box 156, 62 Woodridge Dr. West #1, River Falls, Wis. 54022
Filed Jun. 16, 1989, Ser. No. 368,039
Int. Cl.[5] B62D 43/04
U.S. Cl. 224—42.23 19 Claims

1. A tire holder for carrying a spare tire on an underside of a vehicle, the tire holder comprising:

tire supporting means for carrying the spare tire underneath the vehicle, the tire supporting means having a front end, and a rear end, and a tire mount disposed between the

front and rear ends, the front end adapted to be swingingly connected to the vehicle so that the rear end may be disposed below the front end with the tire mount being angularly disposed relative the underside of the vehicle to allow the spare tire to be slideable off the tire mount,

a lever swingably connected to the rear end of the tire supporting means, the lever including a handle portion and a tire bearing portion, the tire bearing portion being bearable against the spare tire for pushing and retaining the spare tire along and one the tire mount while the lever is being raised to lift the tire mount to a fixed position, and the tire bearing portion being swingable to an out of the away position relative to the tire to permit the tire to slide off the tire mount, and



holding means for holding the handle portion fo the lever in a fixed position relative the tire supporting means and for holding the tire supporting means in a fixed position relative the vehicle, the holding means adapted to be connected to the vehicle and spaced from the rear end of the tire supporting means whereby the spare tire is mountable in an unobtrusive position underneath the vehicle by the lever pushing the spare tire onto the tire mount while the lever is being raised to lift the tire mount and whereby the spare tire is releasable by the spare tire being slideable off the tire mount to an accessible location on the periphery of the vehicle.

4,964,553

UNIVERSAL LONG GUN SUPPORT AND HOLSTER

Donald J. Glynn, 48 Ramblewood Dr., North Chili, N.Y. 14514

Continuation-in-part of Ser. No. 143,837, Jan. 19, 1988, abandoned. This application Mar. 22, 1989, Ser. No. 326,911

Int. Cl.[5] F41C *33/00*

U.S. Cl. 224—149 **14 Claims**

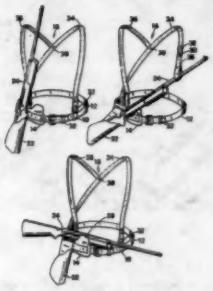
1. A universal long gun support and holster system, comprising:

(a) a waist belt;

(b) a lateral gun support removably attached to said waist belt, comprised of a forestock channel, at least two substantially vertical slots, at least two substantially horizontal slots disposed above said vertical slots, and a ductile anchor plate, wherein said waist belt is disposed within each of said substantially vertical slots in said lateral gun support;

(c) a shoulder strap assembly comprised of a first strap and a second strap, wherein said first strap and said second strap are attached to each other; and

(d) a butt support web removably attached to said lateral gun support, to said first strap, and to said second strap, wherein said butt support web is comprised of at least two finger-like extensions, and wherein each of said finger-like



extensions is disposed within one of said substantially horizontal slots in said lateral gun support.

4,964,554

LOCKING KNIFE AND SHEATH ASSEMBLY

Walter W. Collins, North, S.C., assignor to A. G. Russell, Springdale, Ark.

Filed Aug. 23, 1989, Ser. No. 397,773

Int. Cl.[5] B26B *29/02*

U.S. Cl. 224—232 **14 Claims**

1. In a combination of a sheath and a knife, or the like, an assembly comprising:

a knife having

a blade at one end, and

a hilt with a guard at an opposing end, said guard adjacent said blade;

a sheath having

a closed end dimensioned to receive said blade, and

an open end;

said closed end having

a channel,

a slidable bolt in said channel, and

a spring in said channel biasing said bolt out of said channel;

said open end having

a curved portion, and

an adjacent stepped portion;

said guard riding over said curved portion as said knife is inserted into said closed end, said guard pushing said bolt into said channel against said spring until said guard slips into said stepped portion, said bolt then sliding over said guard to secure said knife in said sheath.

4,964,555

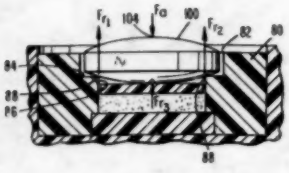
TABLET BREAKING APPARATUS

William Hnatuk, 1561 Bauman Dr., Maple Glen, Pa. 19002

Division of Ser. No. 187,942, Apr. 29, 1988, Pat. No. 4,903,877. This application Dec. 28, 1989, Ser. No. 458,027

Int. Cl.[5] A61J *3/00*

U.S. Cl. 225—93 **9 Claims**



1. Apparatus for breaking a tablet into parts, comprising:

a body having a recess defined in part by a first wall shaped to loosely receive the largest cross-section of said tablet laid therein, said recess having two fixed partial base surfaces extending inwardly from opposite sides of said first wall to partially define two edge portions of a through aperture in said body; and

movable base means for providing an movable partial base to the first recess, said movable partial base normally being coplanar with said fixed partial base surfaces of said recess but being able to restorably recede into said through aperture in response to a user-applied force communicated through said tablet laid inside said recess, whereby said recession of said movable base causes said tablet to experience reaction forces caused by forcible contact between the tablet and the fixed partial base surfaces at said two edge portions defined thereby, the coaction of the user-applied force and the reaction forces producing breakage of the tablet between said two edge portions.

4,964,556

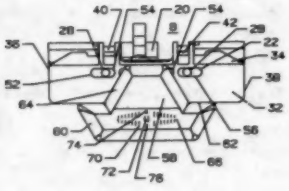
FORMS FEED TRACTOR WITH LID WHICH FACILITATES FORMS ALIGNMENT

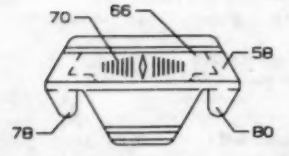
Gregory A. Ferguson, New Bedford, Mass., assignor to Precision Handling Devices, Inc., Fall River, Mass.

Filed Sep. 14, 1989, Ser. No. 407,004

Int. Cl.[5] B65H *20/20*

U.S. Cl. 226—74 **12 Claims**





1. In a forms feed tractor having a frame, a sprocket rotatable in said frame and an endless belt having pins projecting from a surface thereof into a form for feeding said form, said belt being mounted in said frame entrained around and in driving relationship with said sprocket, said form being received on said belt surface with said pins extending through the perforations therein in feeding relationship with said belt, an improved lid pivotly mounted on said frame and movable between a first position adjacent to said surface and capturing said form when said form is disposed on said belt and a second position spaced away from said surface to enable said form to be loaded in said tractor on said belt with said pins in said perforations, said lid having a window through which said form is visible, indicia on said window disposed over said form when said lid is in said first position, said form being movable with said belt to locate said form with respect to said indicia thereby aligning said form in said tractor, said lid having a first portion overlapping said frame, said lid also having an inside edge and an outside edge, said lid being pivotly mounted adjacent to its said outside edge, an extension attached to said lid and extending inwardly from said inside edge overlapping said frame and extending outwardly beyond said inside edge of said lid, said window being disposed in said extension outwardly beyond said inside edge of said lid, whereby said window is located outwardly from said frame overlapping said form but not said frame.

4,964,557

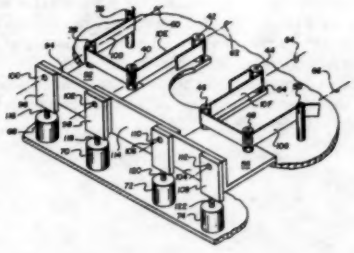
BIDIRECTIONAL WEB GUIDING SYSTEM

Nancy L. Sarkisian, Pasadena, and Stanley W. Martin, Temple City, both of Calif., assignors to Datatape Incorporated, Pasadena, Calif.

Filed Apr. 28, 1989, Ser. No. 345,378

Int. Cl.[5] B65H *26/00*

U.S. Cl. 226—18 **5 Claims**



1. A web guiding system comprising:

first and second members;

first flangeless cylindrical roller means and second flangeless cylindrical roller means respectively mounted on said first and second members for guiding a web along first, second and third web spans in respective first, second and third substantially parallel planes; wherein said web has longitudinal edges and a center line running longitudinally between said edges;

first mounting means for pivotally mounting said first member about a first pivotal axis which substantially coincides with the center line of said first web span;

second mounting means for pivotally mounting said first and second members together about a second pivotal axis which substantially coincides with the center line of said second web span;

sensor means for sensing the edge of said web at respective positions substantially near said second web span, and substantially near said third web span; and

drive means, coupled to said first and second members, for pivoting said first member about said first pivotal axis, when said sensor means detects an error in position of the

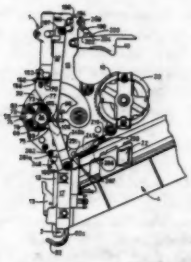
edge of said web from a first predetermined position substantially near said second web span, to return said web edge to said first predetermined position by pivoting said second web span about said first pivotal axis; and for pivoting said second member about said second pivotal axis, when said sensor means detects an error in the position of the edge of said web from a second predetermined position substantially near said third web span to return said web edge to said second predetermined position by pivoting said third web span about said second pivotal axis.

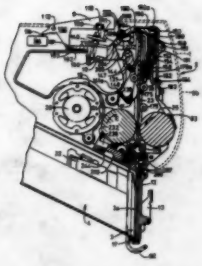
4,964,558

ELECTRO-MECHANICAL FASTENER DRIVING TOOL

John P. Crutcher; J. Charles Huell, both of Cincinnati, and Donald D. Jusks, Winchester, all of Ohio, assignors to Sencorp, Cincinnati, Ohio

Filed May 26, 1989, Ser. No. 358,656
Int. Cl.[5] B25C *1/06*
U.S. Cl. 227—8 **39 Claims**





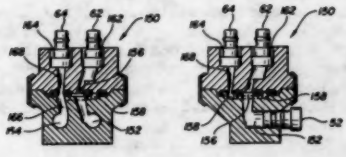
1. An electromechanical fastener driving tool comprising a frame, a tool housing, a guide body and a magazine supported on said frame, a driver located within said frame and shiftable between a normal retracted position and an extended fastener driving position, a first rearward flywheel and a second forward flywheel being located within said frame and having peripheral surfaces, portions of which face each other, said first and second flywheels each having its own shaft, a pair of plate-like load springs in parallel spaced relationship being located exteriorly of said frame, said load springs having first ends, bearings mounted in said first ends of said load springs and being rotatively mounted in coaxial holes in said frame, said first flywheel being located between said load spring with its shaft being rotatively mounted in said load spring bearings, said load springs having second ends, and a pair of eccentric bearing housings each being mounted in a hole in said second end of each of said load springs, each bearing housing being partially received within notches in said frame, said second flywheel being located between said load springs with its shaft rotatively mounted in said load spring eccentric bearing housings, a bracket joining said bearing housings together, said bearing housings being simultaneously rotatable in their respective load spring holes to shift said second flywheel between an inoperative position wherein its peripheral surface is separated from said peripheral surface of said first flywheel by a distance greater than the thickness of said driver, and an operative position wherein said peripheral surface of said second flywheel is spaced from said peripheral surface of said first flywheel by a distance slightly less than the thickness of said driver, means to cause counter rotation of said flywheels irrespective of the position of said second flywheel, means to rotate said bearing housings and shift said second flywheel to its operative position, means to introduce said driver into engagement between said flywheels when said second flywheel is in its operative position to shift said driver through a work stroke, said load springs permitting said second flywheel to yield slightly to accommodate said driver, means to rotate said bearing housings to shift said second flywheel to its inoperative position at the end of said driven work stroke, and means to return said driver to its normal retracted position.

4,964,559

PNEUMATIC SURGICAL STAPLER CONNECTORS

Jess Deniegs; Bela Vincze, both of Flemington, and Jack Pedlick, Butler, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jan. 9, 1989, Ser. No. 294,540
Claims priority, application United Kingdom, Jan. 15, 1988, 8800909
Int. Cl.[5] A61B *17/00*
U.S. Cl. 227—178 **15 Claims**



1. In combination:

a surgical stapler having two pneumatic lines connecting a triggering mechanism and a driving mechanism by means of a shaft, said pneumatic lines traversing said shaft, said pneumatic lines attached to a pneumatic connector comprising:

two mating parts, each said mating part containing two portions of pneumatic lines, one mating part rotatable relative to the second mating part about an axis coincident with both mating parts; and

each said pneumatic line portion of one part corresponding to a pneumatic line portion of the second mating part such that when said mating parts of said connector are mated fluid paths are established through completed pneumatic lines independent of the rotational orientation of one mating part with respect to the other mating part.

4,964,560

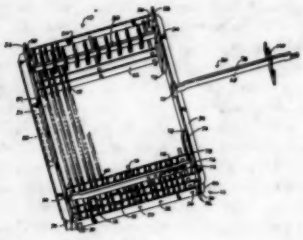
NON-DEDICATED PALLET ASSEMBLY FOR WAVE SOLDERING PACKAGED INTEGRATED CIRCUITS

Charles R. Wharff, 3312 Valley Square La., San Jose, Calif. 95117

Division of Ser. No. 264,453, Oct. 28, 1988. This application Mar. 3, 1989, Ser. No. 319,143

Int. Cl.[5] B23K *37/04*; B23Q *3/00*

U.S. Cl. 228—47 **16 Claims**



1. A pallet assembly for supporting a plurality of objects, comprising:

an exterior support frame subassembly;

an interior support frame subassembly, affixed within the exterior frame subassembly, including a plurality of parallel longitudinal plates and a plurality of parallel lateral plates arrayed normally to said longitudinal plates, said lateral plates being adapted to mate with said longitudinal plates such that one edge surface of each of said plates, being arbitrarily defined as the top edge surface, is coplanar, wherein the intersections of selected adjacent pairs of said longitudinal plates with selected adjacent pairs of said lateral plates form a plurality of receiving nests;

a plurality of modular object holders each being adapted to partially extend into a receiving nest and adapted to hold and support the objects, and each of the modular object holders being adapted to mate with one or more of said receiving nests such that the object is supported outside of said receiving nest while being firmly held in lateral dimensions with respect thereto; and

one or more gate subassemblies adapted to mate with the interior frame subassembly so as to provide vertical securing support to objects carried by the modular object holders situated in a plurality of said receiving nests, each of the gate assemblies being adapted to be readily disengaged such that the objects and the modular object holders may be accessed.

4,964,561

SELF-LOCKING CARTON

Harry I. Whelan, Colonial Heights, Va., assignor to Inland Container Corporation, Indianapolis, Ind.

Filed Jun. 12, 1989, Ser. No. 365,081

Int. Cl.[5] B65D *43/16*

U.S. Cl. 229—102 **5 Claims**

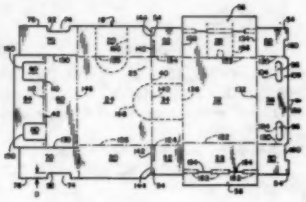
1. A carton assembly, comprising:

a cover member including an inner, hinge mounting end and an opposed outer end with a downwardly depending outer endwall the cover member further including an interior flap extending from the cover outer endwall;

a receptacle member interfittable with the cover member including an inner, hinge mounting end and an opposed outer end with an upstanding outer endwall;

hinge means joining the inner ends of the cover and receptacle members so as to bring the cover and receptacle member outer endwalls immediately adjacent one another when the cover and receptacle members are interfitted one in the other;

a lock tab struck out from the interior flap so as to be upwardly and inwardly extending from the cover outer endwall, said lock tab having an upper free end portion of reduced size extending from a lower portion of enlarged size with laterally extending shoulders between the upper and lower portions, engageable with the receptacle member outer endwall to restrict insertion of the lock tab in said recess;



a recess on the receptacle outer endwall for receiving at least a portion of the lock tab when the cover and receptacle members are interfitted; and

aligning means associated with the cover member for aligning the lock tab for reception in the recess when the cover and receptacle members are interfitted.

4,964,562

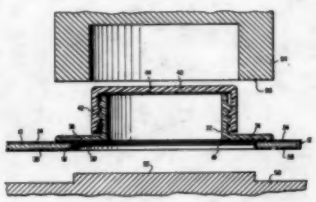
GABLE TOP CONTAINER HAVING A POUR SPOUT FITMENT

Robert L. Gordon, Monroe, N.Y., assignor to International Paper Co., Purchase, N.Y.

Filed Jun. 27, 1989, Ser. No. 371,897

Int. Cl.[5] B65D *5/74*

U.S. Cl. 229—125.15 **7 Claims**



1. A pour spout construction for a paperboard carton, the carton adapted to contain a liquid to be dispensed, the construction including a paperboard carton which has an opening in a planar portion of the carton, both outer and inner surfaces of said planar paperboard portion which are contiguous to and radially outwardly of the periphery of said opening being each covered with a barrier layer material, said two barrier layers also extending radially inwardly of the periphery of said opening, a pouring aperture through the two barrier layers, said aperture being radially inwardly of the periphery of said planar portion opening, a rigid pour spout having an integral annular flange, said flange adhered to said outer barrier layer, the bore of said spout being substantially aligned with said opening, an annular zone of said barrier layers located radially within said opening being sealingly adhered together, whereby the raw edge of the opening in the paperboard is sealed by the barrier

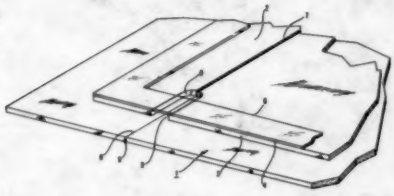
layers and cannot contaminate any contents of the carton either before or after opening.

4,964,563

COVERING FOILS FOR WINDOWS AND PACKING BOXES PROVIDED WITH SUCH WINDOWS

Francois Chaygneaud-Dupuy, Les Grands-Moulins Bouex, Dignac, France 16410

Filed Jun. 7, 1989, Ser. No. 362,767
Claims priority, application France, Jun. 10, 1988, 88 07792
Int. Cl.[5] B65D *25/54*
U.S. Cl. 229—162 9 Claims



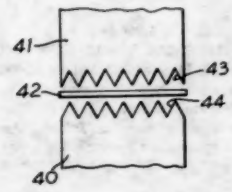
1. A foldable display box comprising a cardboard blank having a window with at least one edge, a rigid transparent foil for covering the window of said cardboard blank, said rigid transparent foil having a first end and a second end, at least one fold line and at least one slot coextensive with said at least one fold line and being located at one of said ends so that when said rigid transparent foil is arranged to cover the window of the cardboard blank, said at least one slot extends at least up to said edge of said window, and a foil of flexible transparent material having no slots is glued to said rigid transparent foil by a glue, both foils having substantially identical dimensions.

4,964,564

ROTATING OR MOVING METAL COMPONENTS AND METHODS OF MANUFACTURING SUCH COMPONENTS

Donald F. Neal, 55 Watling Street, Woodside, Hints, England; Michael W. Kearns, 11 Kingscroft Road, Streetly, England B 76 2HF; Stephen P. Fox, 41 Woodend, Handsworth, England B20 1EW; James E. Melville, 41A Church Lane, Darley Abbey, England DE3 1EX; Kenneth W. Wright, 33 Hillsway, Littleover, England DE3 7DS; Philip S. Wood, 5 Quernmore Drive, Kelbrook, England; John T. Pinder, 3670 Clubland Dr., Marietta, Ga. 30068, and Stephen C. Clark, 3946 Camrose Pl., Marietta, Ga. 30062

Filed Aug. 26, 1988, Ser. No. 238,266
Claims priority, application United Kingdom, Aug. 27, 1987, 8720248
Int. Cl.[5] B23K *20/08*; F02C *7/00*; B21K *3/04*; B23P *15/04*
U.S. Cl. 228—107 8 Claims



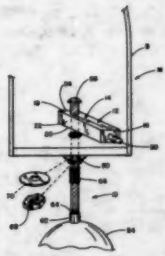
1. A method of manufacturing a composite turbomachinery blade comprising the steps of creating a composite component with at least one of the sides of the component having a surface layer of material different from the body of the component by bonding said surface layer to said body, parting said component at a plurality of locations to provide sections which extend perpendicularly to the plane of said surface layer, forging or machining each parted section into a substantially finished form, each section comprising a surface layer portion and a body portion, and subsequently attaching said section to another component by welding only the body portion of said section to said other component.

4,964,565

MAILBOX SIGNALLING SYSTEM WHICH IS VISIBLE AT NIGHT AND IN DAYLIGHT

James Wood, 22122 U.S. Rte. 33, Marysville, Ohio 43040

Filed Sep. 26, 1989, Ser. No. 412,339
Int. Cl.[5] B65D *91/00*
U.S. Cl. 232—35 7 Claims



1. A signalling system for use on a mailbox, newspaper tube or the like which has a hollow body with an open end and a door pivotally connected to the body to open and close that body, comprising:

(A) a door sensing means mounted on the hollow body adjacent to the door and including

(1) a hollow casing having one end positioned closely adjacent to the open end and having a passage means defined therethrough adjacent to another end thereof,

(2) a piston slidably mounted in said hollow casing adjacent to said one end and moving within said casing and having a door-contacting rod which extends out of said casing one end to contact the door when that door closes the body,

(3) a detent element slidably mounted in said casing adjacent to said casing another end, and

(4) a spring in said casing and having one end thereof engaging said piston and another end thereof engaging said detent element and biasing said detent element away from said piston; and

(B) a signal means mounted on said hollow casing and including

(1) a rod element slidably mounted on said hollow casing and sliding in said passage means in a vertical direction, said detent element engaging said rod element,

(2) a visual indicator attached to said rod element and having a weight which is sufficient to move said rod element downwardly when the door is open,

(3) a stop element on said rod element which engages said casing to prevent said rod element from disengaging from said casing,

(4) said spring element having a spring force sufficient to force said detent element against said rod element with enough force to prevent said rod element from sliding under the influence of said visual indicator weight when the door is closed and said detent element engages said rod element under the influence of said piston and said spring, and

(5) a light system in said visual indicator which includes

(a) a power unit in said visual indicator,

(b) a light bulb in said visual indicator,

(c) a manually operated switch on said visual indicator, said manually operated switch element being closed by manipulation of said visual indicator,

(d) a contact switch on said rod element, said contact switch being closed when said rod element has moved downwardly a prescribed distance after the door has been opened, and

(e) lead means electrically connecting said light bulb to said power unit via said manually operated switch and said contact switch so that both of said switches must be closed to actuate said light bulb.

4,964,566

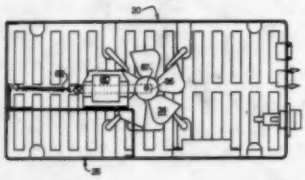
FORCED AIR VENTILATING DEVICE

J. Robert Pugh, Greensboro, and James F. Matherly, Summerfield, both of N.C., assignors to Custom Industries, Inc., Greensboro, N.C.

Division of Ser. No. 258,315, Oct. 14, 1988, Pat. No. 4,877,182. This application Aug. 7, 1989, Ser. No. 390,651

Int. Cl.[5] F24F *13/12*

U.S. Cl. 236—49.3 5 Claims



1. A forced air ventilating device for installation in a structural wall and for use in controlling the movement of air into and out of a prescribed area, said forced air ventilating device comprising:

(a) a ventilator apparatus including:

(i) a first stationary plate means having substantially planar front and rear faces and a plurality of apertures therethrough according to a prescribed pattern,

(ii) a second, movable plate means having substantially planar front and rear faces, a plurality of apertures therethrough and mounted adjacent said rear face of said stationary plate, said second plate being slidingly movable between a first position in which said plurality of apertures in said second plate are out of alignment with apertures in said first plate, and a second position wherein said apertures are aligned with the apertures in said first plate;

(iii) control means for automatically moving said second plate between said first and second positions, wherein said control means is a solenoid having a linkage means operatively connecting said solenoid to said second plate, said solenoid being activated responsive to a thermostat positioned to measure temperature outside the space being ventilated, wherein said linkage means includes:

(a) bias means connected to said linkage means for normally biasing said second plate in said first position;

(b) said linkage means connecting said second plate to said solenoid such that when said solenoid is activated, said bias means is overridden and said second plate is slidingly moved to said second position;

(b) a fan means attached to said ventilator apparatus for moving air therethrough at times when said second plated is in said second position;

(c) sensing means for sensing prescribed conditions of air at at least one selected point; and

(d) electrical means for activating said fan and said control means responsive to a signal from said sensing means that prescribed levels of air conditions have been exceeded.

4,964,567

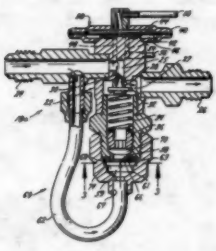
EXPANSION AND CHECK VALVE COMBINATION

Joseph H. Heffner, Chesterfield; G. Thomas Seener, and Dennis L. Hoehne, both of St. Louis, all of Mo., assignors to Sporlan Valve Company, St. Louis, Mo.

Filed Feb. 10, 1989, Ser. No. 309,695

Int. Cl.[5] G05D *27/00*; F25B *13/00*

U.S. Cl. 236—92 B 9 Claims



1. A combination expansion and check valve for controlling the flow of refrigerant in a refrigeration system comprising:

(a) a valve body including an inlet and an outlet, said outlet receiving refrigerant at a lower pressure than the refrigerant pressure in said inlet when refrigerant flow is in a normal direction from said inlet to said outlet,

(b) a control valve means disposed between said inlet and said outlet including:

1. a control valve port,

2. a control valve element movable into and out of engagement with said control valve port to regulate substantially continuous flow between said inlet and outlet when refrigerant flow is normal, and

3. said control valve element being urged into engagement with said control valve port when refrigerant flow is reversed,

(c) by-pass conduit means operatively connecting said inlet and outlet including passage means disposed within the body and an external conduit extending between the inlet and said passage means and check valve means disposed within said passage means, said check valve means including:

1. check valve port means,

2. a check valve element selectively movable into and out of engagement with said port means,

3. said check valve element preventing flow between said inlet and outlet chambers, when refrigerant flow is normal, and

4. said check valve element permitting substantially continuous relatively free flow between said outlet and inlet when refrigerant flow is reversed, and

(d) means for controlling movement of the control valve element when the refrigerant flow is normal.

4,964,568

SHROUDED THERMAL SPRAY GUN AND METHOD

Anthony J. Rotolico, Hauppauge; Janusz R. Wlodarczy, Jackson Heights both of N.Y., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

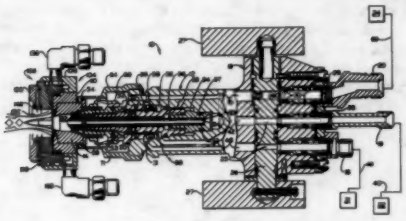
Continuation-in-part of Ser. No. 297,901, Jan. 17, 1989, abandoned. This application Nov. 29, 1989, Ser. No. 439,760

Int. Cl.[5] B05B *1/24*

U.S. Cl. 239—8 50 Claims

29. A method for producing a low oxide coating of oxidizable material, comprising generating a supersonic spray stream of combustion products and heat fusible material in finely divided form, directing a first envelope flow of inert gas adjacently surrounding the spray stream, combustion envelope means for directing a second envelope flow of combustion gas

adjacently surrounding the first envelope flow, directing a third envelope flow of inert gas adjacently surrounding the



second envelope flow, and directing the spray stream toward a substrate such as to produce a coating thereon.

4,964,569

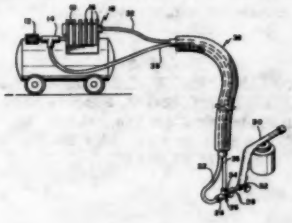
WARM AIR SPRAY SYSTEM

Clarence L. Stevens, Marietta, Ga., assignor to SPR International, Inc., Marietta, Ga.

Filed Jan. 23, 1989, Ser. No. 299,509

Int. Cl.[5] B05B *7/16*

U.S. Cl. 239—13 **5 Claims**



1. A warm air-spray system which comprises:

an oil-less piston-type air compressor which heats air supplied thereto via an inlet end and conducts the warm air to an outlet,

an air-spray device,

a first control valve which is connected at a first end to said air-spray device which controls warm air flow to said air-spray device,

a second air control valve which is connected at a first connection to a second end of said first air control valve which controls air flow to said first air control valve,

an air supply line connected at a first end to said outlet of said air compressor and at a second end to a second connection of said second air control valve for supplying a warm air flow to said air-spray device via said second and first air control valves,

a warm air return line connected at one end to a third connection of said second air control valve to return unneeded warm air back toward said air compressor,

said air supply line and said air return line are secured together over most of their length juxtaposed each other, and

means for insulating said air supply line and said air return line over substantially their entire length.

4,964,570

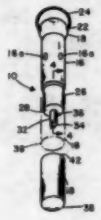
PERFUME DISPENSER

William Halduk, 33 Ledgewood Dr., Smithtown, N.Y. 11788

Filed Nov. 24, 1989, Ser. No. 440,692

Int. Cl.[5] A44C *15/00*

U.S. Cl. 239—36 **6 Claims**



1. An article of personal jewelry for dispensing a fragrant vapor comprising a first hollow member and a second hollow member forming said article when assembled together, said first hollow member comprising means for ventilating the inside of said first hollow member and means for engaging said second hollow member and being capable of adjusting the extent of the engagement with said second member, said second hollow member containing a sealed capsule containing a volatile material and an opening to receive said engaging means, said engaging means comprising hollow needle means to puncture said capsule when said members are engaged beyond a predetermined point so that said first and second hollow members may be engaged with each other without said needle means penetrating said capsule, the extent of the engagement of said members being readily adjustable so that said article of jewelry may be worn without dispensing any vapor from said capsule and then said members may be moved into closer engagement to cause puncture of said capsule by said needle means to dispense said fragrant vapor.

4,964,571

ACTUATOR FOR ACCUMULATOR TYPE FUEL INJECTION NOZZLE

Jun Tsue, and Takeo Yoshida, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 3, 1989, Ser. No. 318,666

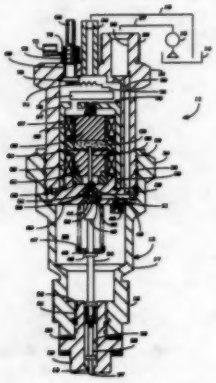
Claims priority, application Japan, Mar. 4, 1988, 63-50954

Int. Cl.[5] F02M *51/00*

U.S. Cl. 239—88 **15 Claims**

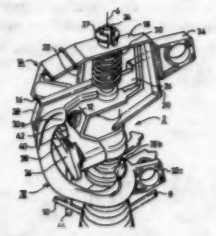
1. An accumulator type of injection nozzle comprised of an accumulator chamber adapted to be supplied with high pressure fuel, an nozzle port leading from said accumulator chamber, an injection valve moveable between a closed position and an opened position for controlling the discharge of fuel from said accumulator chamber through said nozzle port, a control chamber for receiving pressurized fuel, an actuating member supported for movement within said control chamber and associated with said injector valve for retaining said injector valve in its closed position when said control chamber is pressurized and for movement of said injector valve to its opened position when pressure is relieved in said control chamber, and relief valve means moveable between a closed position for maintaining pressure in said control chamber and an opened position for relieving said control chamber for effecting fuel discharge through said nozzle port, the improvement comprising electromagnetic means associated with said relief valve means for urging said relief valve means to one of its positions

when said electromagnetic means is energized, and electrical resistor means in circuit with said electromagnetic means for



varying the force exerted by said electromagnetic means by selecting the value of said electrical resistor means.

4,964,572
ROTARY SPRINKLER
Noam Lemelshtrich, Haesbel Street 57, Herzliya Pituach, Israel
Filed Nov. 16, 1989, Ser. No. 437,069
Claims priority, application Israel, Jan. 13, 1989, 88949
Int. Cl.[5] B05B *3/08, 3/14*
U.S. Cl. 239—230 **12 Claims**



1. A rotary sprinkler, comprising a rotably-mounted sprinkler head having a discharge nozzle for discharging a water jet forwardly of the sprinkler head, an oscillating arm for impacting the sprinkler head to impart a rotary motion thereto, a spring urging said oscillating arm in one direction, and a reaction member carried by said oscillating arm and having an inlet alignable with said discharge nozzle for receiving the water jet, and an outlet laterally of the inlet for imparting a rotary motion to the oscillating arm in the opposite direction by reaction; characterized in that said reaction member defines a helical path of travel of the water from its inlet to its outlet extending laterally of the discharge nozzle.

4,964,573
SHOWERHEAD ADAPTOR MEANS
Pinchas Lipski, 1259 S. Camden Dr., Los Angeles, Calif. 90035
Filed Jun. 21, 1989, Ser. No. 369,458
Int. Cl.[5] B05B *15/08*
U.S. Cl. 239—283 **1 Claim**

1. In a readily adjustable shower head adaptor device for use with a water outlet pipe and having a showerhead handle, a showerhead at one end of the handle, and a flexible tube interconnecting the handle and the outlet pipe for fluid communication between the showerhead and the outlet pipe, the combination:

an elongated cylindrical body member having a longitudinal axis and having a throughbore transverse to said longitudinal axis for adjustably lengthwise receiving the outlet pipe and for pivotal adjustment about the axis of the outlet pipe;

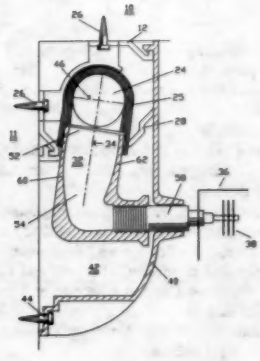
friction means within said body member for frictional contact with the said outlet pipe;

means at one end of the body member for moving said friction means in the direction of the longitudinal axis of said body member to cause releasable frictional contact with the pipe for securing the device in a selected longitudinal and rotational position on the pipe;

handle retaining means at the other end of the body member mounted for pivotal movement about the longitudinal axis of the body member; and

screw means along the longitudinal axis of the body member for holding the handle retaining means, body member, friction means, and means for moving said frictional means in assembly with the water pipe.

4,964,574
CONSTANT PRESSURE NOZZLE SYSTEM
Robert V. Daigle, 762 NE. 42nd St., Pompano Beach, Fla. 33064
Continuation-in-part of Ser. No. 267,855, Nov. 7, 1988, abandoned. This application Sep. 15, 1989, Ser. No. 408,048
Int. Cl.[5] A62C *31/02*
U.S. Cl. 239—589 **13 Claims**



1. A constant pressure fluid flow acceleration nozzle system, comprising:

a nozzle having a bore, said bore having a substantially conical inner surface, from an input having an area Ai to an output having an area Ao, said output being an axial length Xo from said input, in which said conical surface of said bore exhibits a slight convexity relative to a longitudi-

nal axis of said bore and in which the radial cross sectional area Az of said bore, at any axial point Xz between said input and said output of said bore is defined by the equation:

$$Az = Ai - (Xz(Ai - Ao)/Xo),$$

and the radius Rz of any axial point Xz is thereby defined by the equation:

$$Rz = (Az/pi)^{\frac{1}{2}}$$

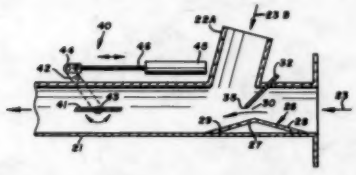
whereby a taper of said substantially conical bore surface in accordance with said equations will effect an increased velocity while maintaining a substantially constant pressure throughout the length of bore, with a resultant low turbulence output of the nozzle system.

4,964,575

BOOM FLOW CONTROL MECHANISM FOR PNEUMATIC SPREADERS

Harry H. Takata, Edina, Minn., assignor to Ag-Chem Equipment Co., Inc., Minneapolis, Minn.

Filed May 30, 1989, Ser. No. 358,666
Int. Cl.[5] A01C 3/06; B05B 1/30
U.S. Cl. 239—655 **13 Claims**



11. In combination with a pressurized pneumatic system for substantially uniform distribution of particulate solids upon the soil from a system mounted upon a self-propelled vehicle and including a reservoir with a source of supply of particulate solids to be distributed, a distribution head means for metering and apportioning particulate solids from said source into a plurality of generally aliquot portions, a plurality of elongated hollow delivery tubes of predetermined and differing lengths extending laterally outwardly of said vehicle from a proximal end to a distal discharge end, a source of compressed air for creating a flow of pressurized air through said hollow elongated delivery tubes, a plurality of tubular feed members, each extending between said distribution head and a selected one of said delivery tubes, for creating a fluid communication link between each of said tubes and said distribution head to accommodate delivery of each of said aliquot portions from the proximal end to the distal discharge end of a boom when operative, a juncture point adjacent the proximal end of each of said hollow elongated delivery tubes for introducing one aliquot portion of particulate solids to the flow of pressurized air moving through each of said delivery tubes when operative, and means adjacent said juncture point for creating a partial vacuum along said delivery tube during times of passage of particulate solids therethrough; the improvement comprising:

(a) shut-off means operatively coupled to each of said elongated delivery tubes and comprising:

(1) delivery tube blocking means positioned within each of said delivery tubes and being disposed in spaced relationship and immediately downstream from said juncture point; and

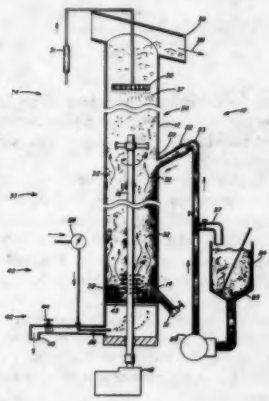
(2) drive means coupled to each of said delivery tube blocking means for advancing preselected ones of said damper blocking means from an open disposition to a closed disposition wherein said delivery tube blocking means occupies and blocks the flow of air across at least about 75 percent of the inner cross-section of said delivery tube.

4,964,576

METHOD AND APPARATUS FOR MINERAL MATTER SEPARATION

Rabinder S. Datta, 610 Tampico Ct., Pittsburgh, Pa. 15239

Continuation of Ser. No. 176,947, Apr. 4, 1988, abandoned. This application Aug. 11, 1989, Ser. No. 392,701
Int. Cl.[5] B02C 23/30, 23/36
U.S. Cl. 241—19 **19 Claims**



1. A process for combined size reduction, classification, and separation of a desired constituent from an undesired constituent of mineral matter comprising the steps of,

introducing into a vessel a slurry of mineral matter particles of an initial size having a desired constituent physically connected to an undesired constituent,

directing the slurry of mineral matter particles in a first direction to a size reduction zone of the vessel,

injecting a separation inducing fluid under pressure into the vessel in a second direction opposite to said first direction into the size reduction zone,

admixing the fluid and mineral matter particles in the size reduction zone,

reducing the size of the mineral matter particles from the initial size in the size reduction zone, thereby liberating the desired constituent in the mineral matter from physical connection with the undesired constituent in the mineral matter,

entraining the desired constituent with the separation inducing fluid in a flow in said second direction from the size reduction zone to a separation zone,

carrying the undesired constituent in the mineral matter in said first direction in the vessel away from the separation zone to a refuse zone,

discharging the entrained desired constituent from the separation zone of the vessel, and

removing the undesired constituent in the refuse zone from the vessel.

4,964,577

PROCESS FOR DIVIDING UP AND RECOVERING THE INDIVIDUAL MATERIALS FROM OLD CABLES

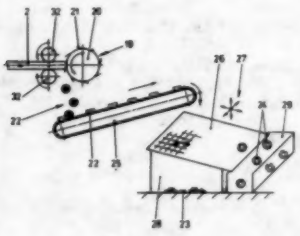
Wilhelm Kopp, Pfrungen, Fed. Rep. of Germany, assignor to Maschinenfabrik Bezner GmbH & Co. KG, Ravensburg, Fed. Rep. of Germany

Filed Jul. 7, 1989, Ser. No. 376,670

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1988, 3823230

Int. Cl.[5] B02C *19/12*

U.S. Cl. 241—24 6 Claims



1. A process for dividing up and recovering the individual materials from old cables, comprising plastic-sheathed and/or metal-sheathed individual cables, cable strands or solid cables, said process comprising:

sorting the cables according to their type;

slitting open the cables and removing from the cables an outer plastic sheathing of the cables to yield slit outer plastic sheathing and plastic-sheathed individual wires having an inner copper or aluminum strand;

granulating the outer plastic sheathing to form plastic granulate;

chopping the plastic-sheathed individual wires to yield wire disks of a disk thickness of 3 to 10 mm; and

vibration screening the wire disks for causing the wire disks to separate into cable pins or strand pins and into plastic sheathing rings.

4,964,578

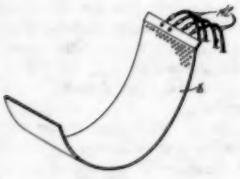
PULVERIZING MILL CONTROL SYSTEM

Martin P. Bender, 1759 Cliffside Ct., Naperville, Ill. 60565

Filed Dec. 1, 1988, Ser. No. 278,801

Int. Cl.[5] B02C *25/00*

U.S. Cl. 241—30 5 Claims



1. A method for controlling the operation of a pulverizing mill, the mill including a housing, an inlet for introducing a bulk product into the housing, a rotor rotatably mounted within the housing and having a plurality of blades thereon with selective faces for breaking the bulk material into particles, a screen of selective size in the housing for sifting the particles, power means for rotating the rotor, feed means for feeding bulk material into the housing, and control circuitry for validating the mill operation, the method comprising:

selecting a rotor blade face for pulverizing the bulk material, generating a first signal corresponding to the selected blade face, and comparing the first signal to a pre-selected blade face signal with the control circuitry;

selecting the screen size, generating a second signal corresponding to the selected screen size, comparing the second signal to a pre-selected screen signal with the control circuitry; and

inhibiting the actuation of the power means to rotate the rotor until the first signal matches the pre-selected blade face signal, and the second signal matches the pre-selected screen signal.

4,964,579

DOCUMENT SHREDDER WITH ONE OR MORE TRAYS FOR STACKS OF PAPER IN CONTINUOUS FORM

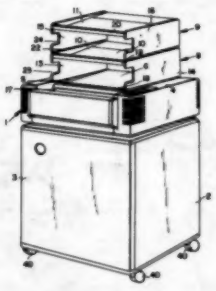
Willi Strohmeyer, Hanover, Fed. Rep. of Germany, assignor to Geha-Werke GmbH, Hanover, Fed. Rep. of Germany

Filed Mar. 15, 1989, Ser. No. 323,918

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1988, 3808486

Int. Cl.[5] B02L *25/00*

U.S. Cl. 241—100 5 Claims



1. A document shredder with at least one tray for holding at least one stack of paper in continuous form, wherein said document shredder contains an infeed duct, said tray is provided with a stop on the side facing said infeed duct of said shredder and is arranged on the top of said document shredder so as to slope towards said stop, at least one tray for a stack of paper is attached to the top of said document shredder, each attached tray having a stop on the side facing said infeed duct and being arranged to slope toward said stop, and each attached tray is held on both sides by side parts, said side parts comprising an upper and a lower region and means for fastening onto the top of said document shredder or to an underlying tray.

4,964,580

CRUSHING MACHINE

Toshio Akesaka, Yokohama, Japan, assignor to Kabushiki Kaisha Iseki Kaihatsu Koki, Tokyo, Japan

Filed Jun. 16, 1989, Ser. No. 367,545

Int. Cl.[5] B02C *19/00*

U.S. Cl. 241—252 7 Claims

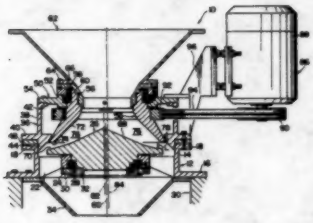
1. A crushing machine, comprising:

crushing means including a first rotary member rotatable about a first axis and a second rotary member rotatable about a second axis, said first and second rotary members being disposed spaced apart from each other in the direction of said first axis to define a crushing chamber for crushing substances between said first and second rotary members, said second rotary member having a hole extending through the central portion thereof in the direction of said second axis for supplying said substances to the crushing chamber, and said crushing chamber having an annular outlet continuously extending about said first

axis permitting crushed substances to flow out from said crushing chamber;

drive means for rotating at least one of said first and second rotary members; and

support means supporting said first and second rotary members maintaining said annular outlet and defining a space for receiving crushed substances from said crushing chamber, said support means comprising: a first annular support member rotatably supporting said first rotary member; a second annular support member supporting said first support member so as to be angularly rotatable about a third axis which is eccentric from said first axis and rotatably supporting said second rotary member; and means for regulating angular rotational position of said first support member relative to said second support member, said means for regulating including a spring for exerting force to rotate said first support member in a direction opposite to that of said first rotary member; an arm mounted on said first support member; and a stopper ;mounted on said second support member and capable of being brought into engagement with said arm.



4,964,581

BOBBIN WINDING METHOD COMPRISING VARIABLE-DURATION INTERVENTIONS FOR RESTORING YARN CONTINUITY, AND DEVICES FOR ITS IMPLEMENTATION

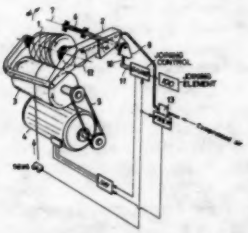
Luigi Colli; Roberto Badiali, and Nereo Marangone, all of Pordenone, Italy, assignors to Savio, S.p.A., Pordenone, Italy

Filed Oct. 6, 1988, Ser. No. 254,406

Claims priority, application Italy, Nov. 13, 1987, 22623 A/87

Int. Cl.[5] B65H *54/22*

U.S. Cl. 242—35.6 R **12 Claims**



1. A method for winding yarn onto a rotating bobbin held by an arm and driven by a drive roller when the yarn feed is broken, comprising:

(a) restoring the broken yarn feed by means of an intervention cycle wherein said cycle has a first portion and a second portion wherein said first portion comprises the steps of:

(1) raising the rotating bobbin from the drive roller when the yarn feed is broken;

(2) braking the rotating bobbin and the drive roller independently until the bobbin stops rotating; and

wherein said second portion comprises joining the broken yarn; and

(b) interposing a variable time delay between the commencement of the bobbin braking step of said first portion of said intervention cycle and the commencement of the yarn joining step of said second portion of said intervention cycle,

wherein said variable time delay is determined by the amount of yarn wound on the bobbin, wherein said amount of yarn wound on the bobbin is determined by measuring the inclination of the bobbin holder arm.

4,964,582

METHOD AND APPARATUS FOR DETECTING THE BOBBIN CIRCUMFERENCE OF CROSS-WOUND BOBBINS AND FOR UTILIZING THE RESULT

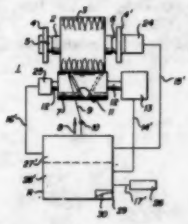
Ferdinand-Josef Hermanns, Erkelenz, and Rolf Hansen, Mönchengladbach, both of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Mönchengladbach, Fed. Rep. of Germany

Filed Mar. 27, 1989, Ser. No. 328,963

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1988, 3810365

Int. Cl.[5] B65H *63/08*

U.S. Cl. 242—36 **38 Claims**



1. Method for detecting and utilizing the bobbin circumference of cross-wound cylindrical or conical bobbins or cheeses in a textile machine producing the bobbins, which comprises:

determining and evaluating the attained circumference of the bobbin from measured values produced by sensors detecting the growth of the bobbin, continuously detecting and processing the measured values in at least one computer for further evaluation, continuously and repeatedly performing anew a mathematical linkage symbolizing the current bobbin circumference cleansed of randomness in the current measured value pickup at very short time intervals based on the measured values for each winding station in the further evaluation, calculating a parameter from the group consisting of current bobbin circumference, bobbin radius and bobbin diameter from the linkage, and using the linkage result with as little delay as possible for at least one purpose from the group consisting of displaying the result, affecting the winding process, detecting the yarn length and terminating the winding process.

4,964,583

METHOD OF TRANSPORTING RAPIDLY QUENCHED RIBBON AND APPARATUS THEREFOR

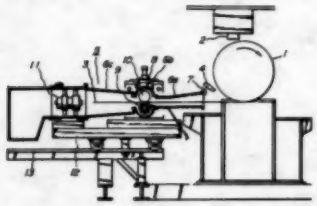
Masao Yukumoto; Kiyoshi Shibuya; Nobuyuki Morito, and Teruo Hiramatsu, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Nov. 15, 1988, Ser. No. 271,740

Claims priority, application Japan, Nov. 19, 1987, 62-290477; Nov. 30, 1987, 62-299886; Dec. 28, 1987, 62-330267; Jun. 20, 1988, 63-150006

Int. Cl.[5] B65H *19/26*

U.S. Cl. 242—56 R 3 Claims



1. An apparatus for transporting a rapidly quenched ribbon to a winding reel, said apparatus comprising an inlet duct hood, a housing hood connected to a rear end of the inlet duct hood, an outlet hood connected to rear end of the housing hood, a pinch roll pair consisting of a brush roll and a solid roll arranged in the housing hood, a suction blower arranged in the outlet hood, and a truck carrying the hoods including the pinch roll and the suction blower.

4,964,584

DEVICE FOR FEEDING A TAPE IN SEVERING A WEB

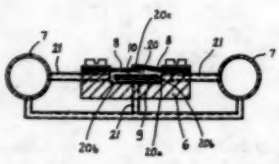
Kari Taipale, Ylöjärvi, and Timo Ojala, Tampere, both of Finland, assignors to Oy Tampella AB, Tampere, Finland

Filed Jun. 23, 1989, Ser. No. 370,844

Claims priority, application Finland, Jul. 6, 1988, 883241

Int. Cl.[5] B65H *19/26, 5/22*

U.S. Cl. 242—56 R 12 Claims



1. A device for feeding a tape which is used to sever a web in a paper or cardboard machine, comprising:

a tape;

feeding means for feeding the tape to an area located between a reel spool and a reel drum, said feeding means including an elongate transfer profile which guides the tape to the area between the reel spool and the reel drum, said transfer profile including an elongate space which is enclosed within four substantially closed sides and in which the tape travels, one of said substantially closed sides including means for permitting the tape to emerge from the elongate space;

conduits connected to the elongate space for directing a gaseous medium into the elongate space; and

means located at one end of the tape for providing a greater flow resistance to the gaseous medium than the rest of the tape.

4,964,585

SLITTING AND REWIDING MACHINE

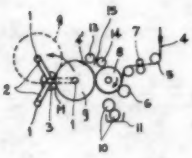
Luigi Negrussi, Sartirana Lomellina, Italy, assignor to Sted Engineering S.R.L., Alessandria, Italy

Continuation-in-part of Ser. No. 197,112, May 20, 1988, abandoned. This application Mar. 16, 1990, Ser. No. 495,389

Claims priority, application Italy, May 20, 1987, 20603 A/87; Apr. 18, 1988, 21087/88[U]

Int. Cl.[5] B65H *19/20, 19/18*

U.S. Cl. 242—56 R 2 Claims



1. A machine for the continuous production of coils of strip material from a continuous sheet of material comprised by:

an axle, including motor means for indexing said axle, and, fixedly mounted bearing means supporting said axle for rotation about a longitudinal axis of said axle;

support arms extending radially of said axle at positions spaced axially of said axle and for the support of core members extending parallel to said axle, said support arms including bearing means accommodating rotation of said respective core members about the longitudinal axis of said respective core members;

a sub-assembly comprised of tensioning rollers, slitting cutters, and a driven feed roller for continuously slitting and feeding cut strips of said sheet material to successive ones of said core members to form coils of said strip material on said core members;

means for driving said feed roller;

said feed roller providing a frictional drive to a selected one of said core members to wind coils of said strip material on said selected core member;

means mounting said sub-assembly, including said feed roller, for movement in a direction radially of the longitudinal axis of said selected core member, and for moving said feed roller into frictional driving engagement with said selected core member;

biassing means for moving said sub-assembly, including said feed roller in a direction to bring said driven feed roller into frictional driving engagement with said selected core member;

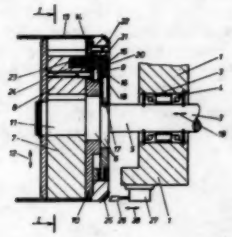
means for severing said strips of strip material on completion of the winding of a coil of preselected diameter on said selected core member; and,

means for indexing said axle on completion of the winding of a coil of a preselected diameter on said core member to move a successive one of said core members into the position of said selected core member to permit commencement of a subsequent winding operation of said strips of strip material onto said successive core member upon the return of said feed roller into frictional driving engagement with said successive core member under the influence of said biassing means.

4,964,586
RELEASABLE HOLDING DEVICE FOR CORES

Rolf Lerch, Darmstadt-Eberstadt, Fed. Rep. of Germany, assignor to Maschinenfabrik Goebel GmbH, Darmstadt, Fed. Rep. of Germany

Filed Nov. 3, 1989, Ser. No. 431,160
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1988, 3837611
Int. Cl.[5] B65H *75/24;* B23Q *3/14;* B23B *5/22*
U.S. Cl. 242—72 R 13 Claims

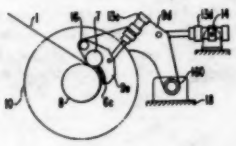


1. A device for releasably holding a core relative to a drive shaft passing therethrough, the holding device comprising:
- at least two clamping elements located in the interior of the core;
- means for displacing said clamping elements radially relative to the drive shaft;
- means for guiding the displacement of said clamping elements;
- a ring surrounding the drive shaft and fixedly connected thereto;
- a ring disc surrounding the drive shaft, said ring disc being fixedly connected to said guiding means;
- means for braking said ring relative to said ring disc; and
- means for releasably engaging said ring disc to prevent said ring disc from rotating.

4,964,587
COILER

Takehiko Oki; Fumio Fukushima, and Katsusuke Kawanami, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 243,561, Aug. 24, 1988, abandoned.
This application Oct. 27, 1989, Ser. No. 428,002
Int. Cl.[5] B21C *47/06*
U.S. Cl. 242—78.1 1 Claim

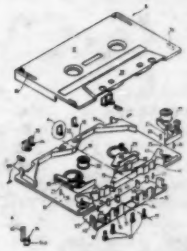


1. In a coiler apparatus including a mandrel, and a plurality of frame units positioned around said mandrel and including rollers for coiling a band plate around said mandrel, the improvement wherein each said frame unit comprises:
- a first frame member having a base end rotatably pivoted about a first shaft extending parallel to the axis of said mandrel and a free end;
- first drive means for pivoting said first frame member about said first shaft such that said free end of said first frame member is moved toward or away from said mandrel;
- a second frame member rotatably pivoted at said free end of said first frame member about a second shaft extending parallel to said axis of said mandrel;
- second drive means coupled to said first and second frame members for pivoting said second frame member about said second shaft relative to said first frame member in directions toward or away from said mandrel;
- an arcuate guide mounted on said second frame member for guiding and assisting in coiling of a band plate about said mandrel;
- a unit roller rotatably supported by said second frame member for pressing the band plate against said mandrel, said unit roller being at a location adjacent said arcuate guide and between said first and second shafts;
- a distance between the center of rotation of said unit roller and the axial center of said second shaft being less than the maximum thickness of a layered coil of the band plate to be coiled about said mandrel; and
- said first shaft being at a location positioned radially outwardly of the maximum outer circumference of the layered coil.

4,964,588
RIGHT PARALLELEPIPED CASSETTE FOR TAPE-LIKE RECORDING MEDIA, AND HOUSING PART THEREOF

Bernd Hoffrichter, Appenweier; Bozidar Pavelka, Willstaett; Dietmar Pfefferkorn, Hemsbach; Norbert Schaeffer, Deidesheim, and Klaus Goetz, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 82,143, Aug. 6, 1987, Pat. No. 4,809,928.
This application Nov. 18, 1988, Ser. No. 272,785
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1986, 8621947[U]
The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.
Int. Cl.[5] G11B *23/87*
U.S. Cl. 242—199 4 Claims



1. A right parallelepiped cassette for a tape-like recording medium which is wound on or unwound from at least one rotatable reel, said cassette being designed to be placed in cooperative relationship with a tape transport apparatus and comprising:
- housing parts including base and lid walls and front, rear and side walls which enclose said rotatable reel and said tape-like recording medium, the front, rear and side walls being at least partly in the form of spacing elements between the base and lid walls and being fastened as such,
- at least one housing part having openings to permit elements of the apparatus access to the recording medium, and
- guide and alignment elements for the recording medium which are arranged at least in the proximity of said housing part,

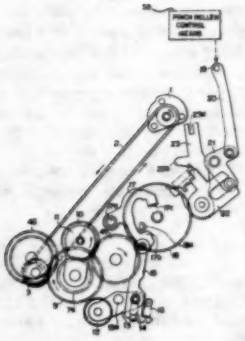
wherein the housing part with the openings is in the form of a separate part extending along the front wall only of the cassette and holds one or more of the guide and alignment elements, and the base wall or lid wall has at least one reference surface on which the housing part can be fastened.

4,964,589

MODE CHANGING MECHANISM FOR A TAPE PLAYER

Hitoshi Okada, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed May 5, 1989, Ser. No. 348,043
Claims priority, application Japan, May 17, 1988, 63-118381
Int. Cl.[5] G11B *15/18*; B65H *20/36*
U.S. Cl. 242—201 **3 Claims**



1. A tape drive mechanism comprising:

a driving source coupled to drive supply and take-up reelbases in normal play and rewind modes;

pinch roller control means including a pivotally mounted pinch roller control member for operating a capstan pinch roller between engaged and disengaged positions;

friction slippage means disposed between said driving source and said reelbases to control the torque delivered to said reelbases;

slippage disabling means for preventing frictional slippage of said friction slippage means in the tape unloading and fast-winding mode, said friction slippage means including a first gear coupled to said driving source, a second gear isolated by a predetermined distance from and disposed coaxially with said first gear, a coaxially mounted friction slippage element frictionally coupling said gears to rotate together, a fast-winding gear configured for simultaneous meshing engagement with said first and second gears, and an arm which is supported pivotally with respect to a base board to rotate responsively to a pivotal movement of said pinch roller control member, said fast-winding gear being supported at an end of said arm to simultaneously engage with or disengage from said first and second gears according to the position of said pinch roller member, said driving source including means for selectively driving said supply and take-up reelbases from said second gear; and

rotatably mounted mode changing means, said arm being also responsively coupled to rotation of said mode changing means to controllably mesh said fast-winding gear with said first and second gears.

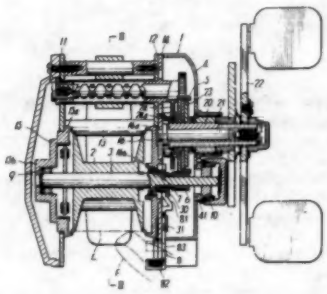
4,964,590

FISHING REEL

Jun Sato, Osaka, Japan, assignor to Shimano Industrial Company Limited, Japan

Continuation of Ser. No. 636,069, Jul. 30, 1984, abandoned, which is a continuation of Ser. No. 440,426, Nov. 9, 1982, abandoned. This application Oct. 1, 1985, Ser. No. 782,177
Claims priority, application Japan, Nov. 11, 1981, 56-168739; Nov. 11, 1981, 56-168740; Oct. 13, 1982, 57-155549
Int. Cl.[5] A01K *89/033*
U.S. Cl. 242—261 **1 Claim**

1. A fishing reel comprising a reel body having a pair of side frames, a spool having a trunk and end flanges connected at opposite ends of said trunk and disposed between said side frames for winding up a fishing line, a drive mechanism for driving said spool, a clutch mechanism for selectively allowing said spool to either be drivingly coupled to said drive mechanism or to freely rotate with respect to said drive mechanism, and a clutch operating mechanism for operating said clutch mechanism, said clutch operating mechanism having a clutch lever located at and extending outwardly from one of said frames in a direction radially of said spool and an operation portion located at said one side frame and connected to an end of said clutch lever, which is movable to a first position where said clutch mechanism is operated to drivingly engage said spool and drive mechanism and to a second position closer to an axis of said spool than said first position where said clutch mechanism is operated to allow free rotation of said spool with respect to said drive mechanism, said operation portion being exposed to the outer surface of said reel body and having an extension extending from said clutch lever at least partially in an axial direction of said spool toward the other side frame,



said extension opposing said one side frame in a radial direction of said spool and having an utmost end which is positioned radially outwardly with respect to a first spool flange located at the side frame at which said clutch lever is located, said utmost end terminating such that it does not substantially intercept any plane which cuts through and is perpendicular to said trunk, said extension, when said operating portion moves to said second position, moving toward the axis of said spool with said utmost end terminating at a location adjacent a periphery of said first flange and in close proximity to an outermost layer of fishing line wound onto said spool so that when said operating portion is pushed by an angler's finger toward said second position where said pushing operation is terminated, said finger approaches said spool making it possible to stop by said finger the free rotation of said spool, in continuation of the pushing of said operation portion to said second position and wherein said one side frame has a recess therein and said clutch lever is mounted to extend outwardly from said one side frame through a bottom face of said recess.

4,964,591

PROJECTILE HAVING NONELECTRIC INFRARED HEAT TRACKING DEVICE

Donald W. Wilmot, Decatur, Ga., and Robert T. Taylor, Hampton, Va., assignors to QuesTech, Inc., Falls Church, Va.

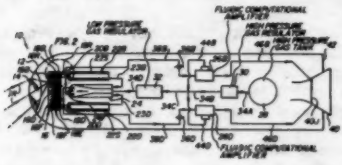
Filed Apr. 14, 1989, Ser. No. 338,276
Int. Cl.[5] F41G *7/26*
U.S. Cl. 244—3.16 **26 Claims**

1. A projectile for destroying a target, comprising:

(a) a body having a front end;

(b) a nonelectronic means, disposed in the front end of the body, for tracking and homing in on the target;

(c) a fluidic circuit means, disposed in the body, for controlling flight of the body towards the target; and



(d) a means for coupling the nonelectronic means to the fluidic circuit means.

4,964,592

FLUID DISTRIBUTOR

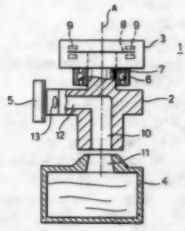
Walter Kranz, Taufkrichen, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 31, 1989, Ser. No. 429,853

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1988, 3838100

Int. Cl.[5] F41G *7/00*; F42B *15/01*

U.S. Cl. 244—322 **7 Claims**



1. A fluid distributor comprising a body of revolution arranged around an axis of rotation and having a fluid passage communicating with a fluid source and with an exhaust passage, the exhaust passage being connected to said fluid passage and emerging from a side wall of the body of revolution, whereby fluid flows out of the exhaust passage as a fluid jet in a direction which does not intersect the axis of rotation of the body of revolution, setting the body of revolution into rotation, further comprising a restraining and releasing device for the body of revolution to retain the body of revolution in a fixed rotational position and to release the body of revolution out of the rotational position, and further comprising:

first and second stops for limiting the turning capacity of the body of revolution, whereby the body of revolution abutting against the first stop turns in the direction of the second stop, when said body of revolution is released by the restraining and releasing device;

a jet baffle unconnected with the body of revolution and lying opposite the exhaust passage of the body of revolution in the discharge direction of the fluid, when the body of revolution abuts against the second stop, and diverting a major portion of the fluid jet emerging from the exhaust passage in the direction of rotation; and

a supporting surface provided on the body of revolution, the diverted fluid jet pushing against said supporting surface after emerging from the exhaust passage, so that body of revolution released by the restraining and releasing device is rotated from the second stop in the direction of the first stop and makes contact therewith.

4,964,593

MISSILE HAVING ROTOR RING

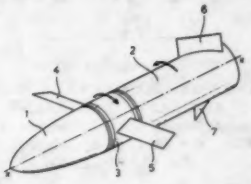
Walter Kranz, Taufkirchen, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 3, 1989, Ser. No. 389,174

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1988, 3827590

Int. Cl.[5] F42B *10/02*

U.S. Cl. 244—3.24 **12 Claims**



1. A missile having a rotor ring, the rotor ring having at least one adjustable fin, the fin being actuated by relative rotation between the rotor ring and the missile, at least one motor means being arranged between the rotor ring and the missile and further comprising a control means for switching the motor between motor means and generator operation and for performing fin adjustment.

4,964,594

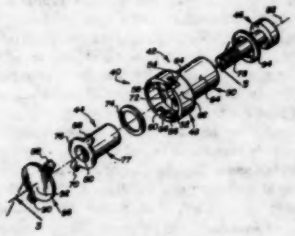
BLIND FASTENER HAVING SPECIAL UTILITY IN THE INSTALLATION OF TRANSPARENCIES IN AIRCRAFT AND THE LIKE

Roger M. Webb, Dallas, Tex., assignor to Texstar, Inc., Grand Prairie, Tex.

Filed Apr. 11, 1988, Ser. No. 179,976

Int. Cl.[5] F16B *37/04*; B64C *1/12*

U.S. Cl. 244—131 **8 Claims**



1. A threaded fastener adapted to be tightened from one end thereof, comprising:

(a) an elongated housing having a top, a bottom, and a longitudinal bore therethrough, the top having a longitudinally extending shoulder adapted to accomodate compressive loads, and the exterior of the housing having a configuration that fosters connection to some mounting structure;

(b) a sleeve adapted to be selectively insertable into the housing, but being incapable of passing all the way through the housing, said sleeve being internally threaded, and the sleeve having a structural element which is sized and positioned so that it may bear against the longitudinally extending shoulder of the housing when the sleeve is rotated with respect to the housing;

(c) a cap that is formed from a rubber-like material which snugly fits into the open housing top so as to help prevent contaminants from passing through the top of the fastener

and coming into contact with the internal portions of the sleeve; and

(d) a bolt adapted to pass longitudinally into the housing from the bottom thereof, and the bolt having threads which are complementary to the internal threads in said sleeve, whereby the bolt threads may be selectively engaged with the sleeve threads, and whereby the bolt may be rotated about its axis from the bottom of the fastener, and whereby a desired amount of torque may be applied to the bolt as said structural element on the sleeve bears against the longitudinally extending shoulder of the housing.

4,964,595

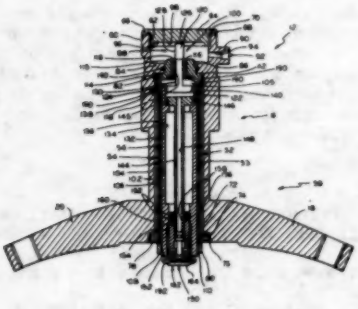
ENTRAPPED GAS EJECTOR ARRANGEMENT FOR AIRCRAFT STORE RACKS

John P. Nordhaus, Northbrook, Ill., assignor to Scot, Inc.

Filed Mar. 28, 1989, Ser. No. 329,663

Int. Cl.[5] B64D *1/08*

U.S. Cl. 244—137.4 **7 Claims**



1. In a ballistic gas operated ejector mechanism for store rack assemblies for ejecting a store from aircraft in flight, and ballistic gas actuated from a ballistic gas supply source,

said ejector mechanism comprising:

a telescoping assembly including an elongate housing defining an upper end, and a lower end, and an internal chamber extending longitudinally thereof, and mounting in said chamber an outer tubular piston, and an inner piston within said outer piston,

said housing chamber and said pistons having a telescoped substantially coaxial dormant relation, said pistons having like ends of same disposed adjacent said lower end of said housing in said dormant relation, and said pistons having the other ends thereof disposed above said like ends thereof in said dormant relation,

said housing adjacent said upper end of same including an internal shoulder defining a seat, for said other end of said outer piston, said housing shoulder having an opening formed therein extending longitudinally of said housing,

said outer piston at said other end thereof defining a stub portion proportioned for substantially complementary fit within said housing shoulder opening in said dormant relation of assembly,

said housing defining, between said lower end of same and said shoulder, said internal chamber thereof,

with said housing defining an internal chamber being proportioned for slidably mounting said outer piston therein for downward movement of same relative to said housing to extended relation with respect to said housing,

said outer piston, between said ends thereof, defining an internal chamber proportioned for slidably mounting said inner piston therein for movement of same to extended relation with respect to said outer piston,

said outer piston shiftably mounting a headed stem valve member in said stub portion thereof, and said outer piston stub portion defining a plurality of ballistic gas ports therethrough about said stem valve member,

said headed stem valve member comprising a head portion and a stem portion,

with said head portion of said valve member being disposed within said chamber of said outer piston for closing said outer piston ports when disposed against said outer piston stub portion, and said stem portion of said valve member projecting through said outer piston stub portion,

said housing upper end being adapted to be connected to a source of ballistic gas and including means for exposing said outer piston stub portion to the ballistic gas when the source of the ballistic gas supplies the ballistic gas to said housing,

said housing upper end including stop means for engaging said valve member stem portion for disposing said head portion thereof short of closure of said outer piston ports when said assembly is in said dormant relation,

said valve member being proportioned for shifting said valve member to close said outer piston ports when said outer piston internal chamber is ballistic gas pressurized and said outer piston has sufficiently moved toward said extended relation thereof to separate said valve stem portion from said housing stop means,

and including stops for precluding said pistons from moving away from said housing other end beyond their respective extended relations,

whereby, on ballistic gas being admitted under pressure to said housing at said exposing means when said housing and said pistons are in said dormant relation, ballistic gas passes through said outer piston ports to bias said outer piston against said seat, thrust said inner piston to said extended relation thereof with respect to said outer piston, and pressurize said outer piston chamber,

and when said inner piston reaches said extended relation thereof relative to said outer piston, said outer piston moves toward said extended relation thereof relative to said housing, to separate said valve member stem portion from said housing stop means and permit the ballistic gas pressure then in said outer piston chamber to bias said headed stem valve member to close said ports, for trapping ballistic gas under pressure in said outer piston chamber, whereby the trapped ballistic gas acts resiliently in compression, under the inertia of the store being ejected, to bias said inner piston to apply thrust to the store up to said extended relation of said outer piston with respect to said housing.

4,964,596

SPACECRAFT STRUCTURE FOR ORBITAL ASSEMBLY AND SERVICING

Eugene R. Ganssle, Skillman, N.J., and Alan Lochead, Levittown, Pa., assignors to General Electric Company, E. Windsor, N.J.

Continuation of Ser. No. 891,393, Jul. 31, 1986, abandoned. This application Dec. 11, 1987, Ser. No. 133,164

Claims priority, application United Kingdom, Oct. 30, 1985, 8526723

Int. Cl.[5] B64G *1/40, 1/64*

U.S. Cl. 244—158 R **17 Claims**

2. A method for transporting a disassembled spacecraft into space by use of an Earth-to-space transport vehicle including a cargo bay and a manipulable arm, and for assembling said spacecraft in space, said spacecraft comprising (a) a payload module including mission sensors and mission equipment, and also including a first docking fitting at one end thereof, and (b) a propulsion module including fuel tanks and thrusters, and also including a second docking fitting at one end thereof, and (c) a bus module including electric power generation, communications and data handling systems, and also including at one end thereof a third docking fitting adapted to mate with said first docking fitting and at the other end thereof a fourth dock-

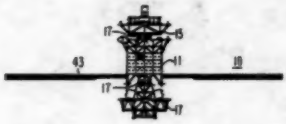
ing fitting adapted to mate with said second docking fitting, comprising the steps of:

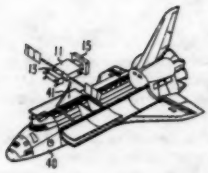
mounting said payload module in said cargo bay with said first docking fitting facing out of said cargo bay;

mounting said propulsion module in said cargo bay with said second docking fitting facing out of said cargo bay;

mounting said bus module in said cargo bay;

using said arm, removing said bus module from said cargo bay, and positioning said bus module so that one of said third and fourth docking fittings dock with one of said





first and second fittings, respectively, to thereby couple together said bus module and one of said payload and propulsion modules to form a partial spacecraft;

using said arm, removing said partial spacecraft from said cargo bay, and positioning said partial spacecraft so that the other one of said third and fourth docking fittings docks with the other one of said first and second fittings to form an assembled spacecraft;

using said arm, removing said assembled spacecraft from said bay; and

releasing said assembled spacecraft from said arm.

4,964,597

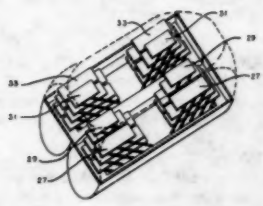
SPACE VEHICLE WITH COLLAPSIBLE LIVING QUARTERS

Yousef Hijazi, P.O. Box 2, Makkah, Saudi Arabia

Filed Mar. 15, 1989, Ser. No. 323,751

Int. Cl.[5] B64G *1/10*

U.S. Cl. 244—159 **27 Claims**



16. A collapsible building construction system for lunar or planetary surface applications comprising:

a space vehicle having a substantially cylindrical body portion, a curved cylindrical wall defining the exterior of the cylindrical body portion, the cylindrical body portion divisible along its long axis for opening into two semicylindrical halves which are joined to each other, each semicylindrical half adapted for resting on the planetary surface with the cylindrical wall of the semi-cylindrical half contacting the lunar surface and the flat planar portion of the semi-cylindrical half spaced apart from and in a plane parallel to the lunar surface,

a collapsible frame structure having horizontal floor slabs and pivotal columns connecting the horizontal floor slabs, the collapsible frame structure stored in the semi-cylindrical half,

pivot joints connecting the horizontal floor slabs to the pivotal columns to provide a scissors-like movement between the floor slabs and the pivotal columns,

a base platform firmly affixed in the semicylindrical half, the base platform providing a structural support for the collapsible frame structure,

a flexible canopy structure stored in the semicylindrical half, the canopy covering the collapsible frame structure above the lunar surface when it is erected to an upright position, the canopy having inside and outside walls defining a cavity between them, and

means for filling the cavity with ground regolith to create a radiation shield to protect inhabitants occupying the collapsible frame structure.

4,964,598

APPARATUS AND METHOD FOR CONTROLLING AIRCRAFT, PARTICULARLY REMOTELY-CONTROLLED AIRCRAFT

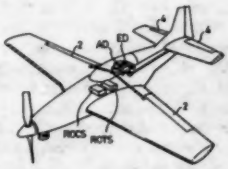
Zacharia Berejik, Ramot Tzahala, and Allon Wallach, Moshav Talmei Elazar, both of Israel, assignors to B.T.A. Automatic Piloting Systems Ltd., Tel Aviv, Israel

Filed Dec. 19, 1988, Ser. No. 285,918

Claims priority, application Israel, Mar. 14, 1988, 85731

Int. Cl.[5] B64C *13/20*

U.S. Cl. 244—190 **16 Claims**



6. A remotely-controlled aircraft, comprising:

ailerons and a drive therefor for controlling the roll changes of the aircraft;

elevators and a drive therefor for controlling the pitch changes of the aircraft;

a receiver for receiving, from a remotely-located transmitter, a bank-angle command signal to be applied to the aileron drive for controlling the aircraft roll changes, and a pitch-angle command signal to be applied to the elevator drive for controlling the aircraft pitch changes;

a sensor for sensing the actual rate-of-climb of the aircraft and for generating a rate-of-climb signal proportional thereto, which latter signal is inherently also proportional to the actual pitch-angle of the aircraft;

and means for applying said rate-of-climb signal to the elevator drive as a negative feedback signal with said pitch-angle command signal to thereby position stabilize the pitch-angle of the aircraft.

4,964,599

SYSTEM FOR CONTROLLING ROLL AND YAW OF AN AIRCRAFT

Jacques Farineau, Toulouse, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

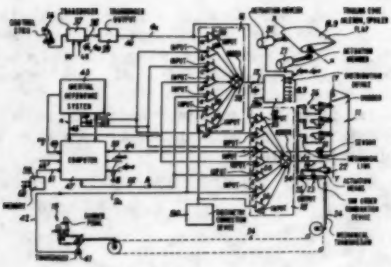
PCT No. PCT/FR88/00329, § 371 Date Jan. 9, 1989, § 102(e) Date Jan. 9, 1989, PCT Pub. No. WO88/10458, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 20, 1988, Ser. No. 320,094

Claims priority, application France, Jun. 24, 1987, 87 08870

Int. Cl.[5] B64C *13/22*

U.S. Cl. 244—195 20 Claims



1. System for controlling roll and yaw of an aircraft (1) comprising roll control surfaces (8, 9) actuated from a first voluntary actuation member (14) and a rudder (11) actuated from a second voluntary actuation member (15), via a mechanical transmission (24), said first and second voluntary actuation members (14, 15) being associated with transducers (37, 39–41) delivering respectively first and second electrical signals depending on the position of said members, said aircraft comprising in addition means (43, 47) capable of delivering third, fourth, fifth and sixth electrical signals respectively representative of the rolling speed, the attitude, the yaw speed and the sideslip of said aircraft, said system comprising:

(a) a device (16) capable of elaborating, from said first, third, fourth, fifth, sixth and second electrical signals respectively representative of the position of said first voluntary actuation member, the rolling speed, the attitude, the yaw speed, the sideslip and of the position of said second voluntary actuation member, a single electrical order for roll control formed by a linear combination of said first to sixth electrical signals;

(b) a distribution device (20) which, from said single electrical roll control order, controls each of said roll control surfaces via first actuation means (21);

(c) a device (18) capable of elaborating, from said first, third, fourth, fifth, sixth and second electrical signals respectively representative of the position of said first voluntary actuation members, the rolling speed, the attitude, the yaw speed, the sideslip and of the position of said second voluntary actuation member, an electrical order for yaw control formed by a linear combination of said first to sixth electrical signals; and

(d) a device (23) for combining said electrical yaw control order and a mechanical order coming directly from said second voluntary actuation member (15) via said mechanical transmission (24), to delivery a single combined order of yaw control, which controls said rudder (11), via second actuation means (26).

4,964,600

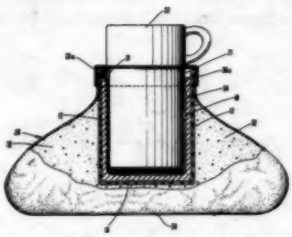
INSULATED CUP HOLDER WITH FLEXIBLE BASE MEMBER

San F. Lee, 3922 W. Osborne, Tampa, Fla. 33614

Continuation of Ser. No. 190,863, May 6, 1988, abandoned. This application May 17, 1989, Ser. No. 353,982

Int. Cl.[5] F25D *3/08*

U.S. Cl. 248—146 11 Claims



1. An insulated cup holder, comprising:

a rigid, cylindrical frame member having an uppermost rim;

said frame member having an imperforate bottom wall and sidewalls projecting upwardly therefrom, defining a first cavity means therebetween;

a layer of breakable insulating material disposed in overlying relation to interior surfaces of said frame member bottom wall and to at least a lower portion of said side-walls;

an upper part of said sidewalls extending upwardly of an uppermost end of said insulating material;

a base member for supporting said frame member;

said base member including a flexible bag means having an annular mouth;

said flexible bag means defining a second cavity means;

a flowable, unbreakable granular material completely filling said second cavity means;

said bag means and said frame member being fixedly secured to one another, said annular mouth of said bag means being secured to said frame member sidewalls, slightly downwardly of the uppermost rim of said frame member so that said frame member is substantially surrounded by said granular material, thereby enhancing the insulation of said frame member;

a cup-engaging and centering means releasably secured to the uppermost rim of said frame member;

said bag means having a flexible bottom wall capable of conforming to the contour of an uneven support surface; and

a plurality of non-skid pad members being secured to an exterior surface of said bag means bottom wall at randomly spaced positions thereupon.

4,964,601

CONTAINER FOR ATTACHMENT TO A LADDER

Paul L. Dishman, 116 Brainerd Blvd., Sharon Hill, Pa. 19079

Continuation-in-part of Ser. No. 209,545, Jun. 21, 1988, abandoned. This application Mar. 21, 1989, Ser. No. 326,310

Int. Cl.[5] E06C *7/14*

U.S. Cl. 248—210 1 Claim

1. A portable open container for holding work instruments at a convenient location on a ladder, comprising

a rectangular bottom wall and a front wall, rear wall and two side walls extending upwardly from the rectangular bottom wall to form a rectangular container that is open at the top to allow work instruments to be inserted therein,

a pair of closed belt loops formed on the front wall of the container at different heights along the front wall and extending outwardly therefrom,

a pair of elastic bands wrapped around the container through the belt loops,

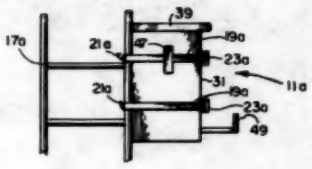
the belt loops positioning and supporting the elastic bands on the walls of the container,

the elastic bands each including hooks at both ends which lock the ends of elastic bands together around the container for securely holding the rear wall of the rectangular container against a support,

a removable divider positioned between the front wall and the rear wall at right angles thereto for dividing the container into two sections,

flanges formed in the front wall and rear wall and located adjacent both sides of the divider to support and position the removable divider in the container,

a pair of L-shaped support members formed on a side wall of the container and extending outwardly therefrom to hold and support a work instrument such as a roller paint brush on the outside of the container, a channel formed on the outside portion of the front wall and the two side walls at



the top of the container for holding small items such as nuts, bolts,

a drain hole formed in the bottom wall of the container for draining liquids therefrom,

a removable liquid-tight plug positioned in the drain hole for stopping the flow of liquids from the container,

a handle positioned on the outside of a side wall for carrying the container, and

a shelf formed on the inside portion of a side wall extending into the container to provide a surface against which a work instrument may be wiped,

wherein when it is desired to attach the open container to a ladder or the like, the container is placed flush against the ladder and the ends of the elastic bands are wrapped around the side of the ladder and hooked together to securely hold the container to the ladder and the rectangular shape of the container provides a stable and secure interface between the ladder and the container.

4,964,602

DRIVE SCREW EYE OR HOOK

Timothy D. Reinhard, 2514 Jackson Ave., Evanston, Ill. 60201

Filed Jun. 22, 1989, Ser. No. 369,747

Int. Cl.[5] F16B *23/00*

U.S. Cl. 248—217.4 **14 Claims**

1. A support device, comprising:

a shank having a threaded end adapted to be driven into a member for securing said shank therewithin, and having a circular configuration and integral with said shank;

torquing protrusion integral with said circular configuration end and aligned with the outside circumference of the longitudinal axis of said shank which bisects said circular configuration end; and

said torquing protrusion having at least one torquing cavity for receiving a torquing tool.

4,964,603

MOUNTING

John Yair, Worcestershire, Great Britain, assignor to Imblex (Monmouth) Limited, Cwmbran, United Kingdom

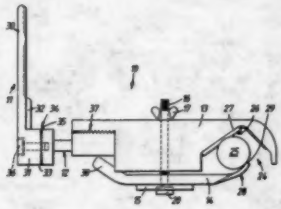
PCT No. PCT/GB87/00110, § 371 Date Aug. 2, 1988, § 102(e) Date Aug. 2, 1988, PCT Pub. No. WO87/05082, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 16, 1987, Ser. No. 228,920

Claims priority, application United Kingdom, Feb. 19, 1986, 8604100

Int. Cl.[5] A47B *96/06*

U.S. Cl. 248—230 **3 Claims**



1. A mounting for attaching an article to a generally cylindrical support comprising, a main body defining a recess for receiving a support, means for supporting the article on the main body, a clamp member movable relative to the body and having a projecting portion for engaging the support to retain the support in the recess, means for urging the clamp member and the body together such that the portion of the clamp member extends into the recess to clamp the support in the recess, said supporting means including means for holding the article, a coupling for allowing rotation of the holding means about an axis, and means for locking the coupling in a selected rotational position, said locking means including the clamp member.

4,964,604

HANGING BRACKET FOR CURTAIN RODS

Emile Lombard, 145 Sun Valley Dr., Slidell, La. 70458

Filed Dec. 26, 1989, Ser. No. 456,462

Int. Cl.[5] A47H *1/10*

U.S. Cl. 248—262 **9 Claims**

1. An improved curtain rod mounting bracket, comprising:

(a) a principal body portion for positioning against the face of molding surrounding a window where a curtain is to be hung;

(b) a bracket hook extending outwardly from the face, for securing the end of a curtain rod thereupon;

(c) a first mounting member extending rearwardly of the face of the body portion, and supported along the upper edge of the window molding;

(d) a second mounting member portion rearwardly from the principal body portion supported along the side edge of the window molding; and

(e) means extending from the first and second body portions, for insertion into the window molding along the top edge and the side edge respectively so as to secure the bracket in position at the top corner of the molding when the body portions are supported against the top and side edge of the molding respectively.

4,964,605

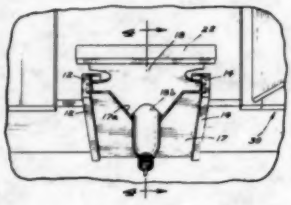
EXTENSIBLE BOTTLE DRAINING SHELF

Herbert O. Beyer, and Diana Beyer, both of H 14163 Highway J, Wausaw, Wis. 54401

Filed Sep. 15, 1989, Ser. No. 407,872

Int. Cl.[5] A47K *1/08*

U.S. Cl. 248—311.3 4 Claims



1. An extensible bottle draining shelf, having in combination

a pair of superposed spaced plate members having vertically aligned open ended Vee cuts therein in a forward portion thereof,

transversely spaced side wall frame members having facing vertically spaced longitudinal slots therein having adjacent edges of said plate members secured therein,

a plate member slidably disposed between said spaced plate members having an open ended Vee cut in the rearward portion thereof in reverse vertical alignment with said Vee cut portions in said spaced plate members,

stretchable means connecting said plate member with said pair of superposed plate members,

bracket means slidably mounting said wall frame members onto the bottom wall of an upper kitchen cabinet,

a stop member carried by said spaced plate members in connection with said bottom wall of said cabinet limiting the forward movement of said superposed plate members, whereby

said plate member is extensible forwardly relative to said superposed plate members to open the vertical space between said aligned Vee cut portions to have a bottle disposed and gripped therein.

4,964,606

OVERHEAD MOUNT FOR A CRT

Don E. Beam; David C. Wills, both of Cambridge, Ohio, and Donald L. Forsythe, Norcross, Ga., assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 26, 1989, Ser. No. 427,053

Int. Cl.[5] A47F *7/00*

U.S. Cl. 248—333 6 Claims

1. An apparatus for vertically adjustably mounting a device from the ceiling comprising:

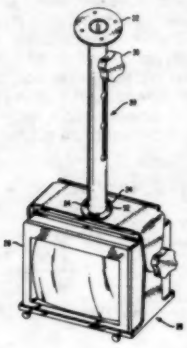
a pair of elongated support members one of which is slidably mounted within the other, said other one of said support members being secured to a ceiling surface;

support means secured to said one of said pair of support members for supporting a device in an adjusted position;

said one of said support members including a first and a second slot extending along the long axis of the member and a plurality of first apertures intersecting said first slot;

said other of said support members including a second and a third aperture;

a locking member positioned in said second slot and within one of said first apertures and within said second aperture upon movement of said one of said pair of support members to a position within the other of said pair of support members to align one of said first aperture with said second aperture locking the support members and the device in the adjusted position, said third aperture being aligned with said second slot when said locking member is mounted in said second slot and one of said first apertures; and



said apparatus further including guide means positioned in said third aperture and said second slot for holding the support members and the device in the adjusted position.

4,964,607

HEIGHT ADJUSTABLE PLATFORMS

Richard A. Lindsay, Gislingham, United Kingdom, assignor to Vinten Group plc, Bury St. Edmunds, United Kingdom

Filed Feb. 14, 1989, Ser. No. 310,765

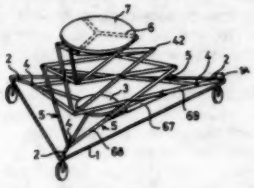
Claims priority, application United Kingdom, Feb. 19, 1988, 8803879

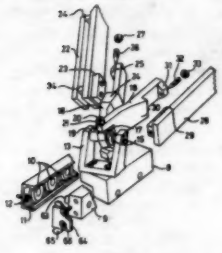
Int. Cl.[5] F16M *13/00*

U.S. Cl. 248—421 13 Claims

1. A height adjustable support for a load carrying platform comprising a base, and a generally pyramidal framework made up of a plurality of lazy tong struts which become progressively shorter in length from the base to the load carrying platform, each strut being connected to a strut in an adjoining side of the structure by hinge means to enable the support to concertina, and each hinge means additionally incorporating pivotal means to allow a strut to rotate about an axis which is

substantially vertical when the platform is at its lowermost position, whereby each hinge accommodates changes in true





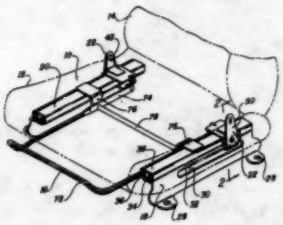
angle between adjoining struts as the platform is raised and lowered.

4,964,608

VEHICLE SEAT ADJUSTER WITH INTEGRAL POSITIVE LOCKING TRAVELING SEAT BELT ANCHORAGE

Richard L. Rogala, Howell, and Omar D. Tame, West Bloomfield, both of Mich., assignors to Hoover Universal, Inc., Ann Arbor, Mich.

Filed Feb. 9, 1989, Ser. No. 308,650
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—429 **12 Claims**



1. A seat adjuster for a motor vehicle seat assembly enabling fore-and-aft adjustment of the seat and providing an anchorage point for a seat belt restraint system which moves with the seat during adjustment, comprising:

a base having mounting means for attachment to a motor vehicle,

a toothed rack on said base,

a sliding rail slidably movable with respect to said base and adapted to be coupled to said seat,

a latch mechanism carried by said sliding rail and having engagine means for meshiing with said toothed rack, said latch mechanism movable to an engaged position wherein said engaging means meshes with said toothed rack thereby coupling said base and said sliding rail together preventing seat adjustment, and to a disengaged position in which said engaging means engages disengages said toothed rack enabling said sliding rail to be moved along said base permitting the position of said seat to be adjusted,

release means for moving said latch mechanism between said engaged and disengaged positions,

a latch plate coupled to said sliding rail including anchorage means for enabling said seat belt restraint system to be attached to said seat adjuster and further including means for supporting said release means as said release means is moved between said engaged and disengaged positions and

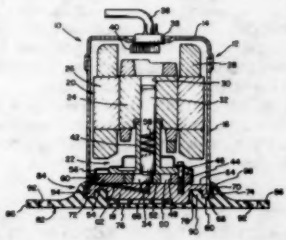
said latch mechanism including a latching plate having a slot with said anchorage means disposed through said slot whereby said anchorage means and said slot support said latching plate and allows said latching plate to be moved as said latch mechanism is moved between said engaged and disengaged positions.

4,964,609

COMPRESSOR MOUNTING APPARATUS

Philip A. Tomell, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Jun. 14, 1989, Ser. No. 365,697
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—638 **20 Claims**



17. A mounting boot for mounting a hermetic compressor to a horizontal support surface, wherein the compressor includes a housing having a top end, a bottom end with an annular groove, and an intermediate portion, said boot comprising:

a resilient cup-shaped body member including a generally horizontal bottom portion attachable to a horizontal support surface, an upwardly extending cylindrical wall shaped to fit into said groove, and a plurality of retainers positioned around said cylindrical wall and each said retainer having an upper portion and an inwardly facing surface defining a restricted gap between said upper portion and said cylindrical wall, said restricted gap adapted for hooking around and frictionally engaging the compressor bottom end such that the compressor bottom end is substantially covered.

4,964,610

MANUAL BLOWOUT PREVENTER WITH INVERTIBLE RAMS

Kwok-Ping Wong, Irving, and Glenn R. Davis, Euless, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

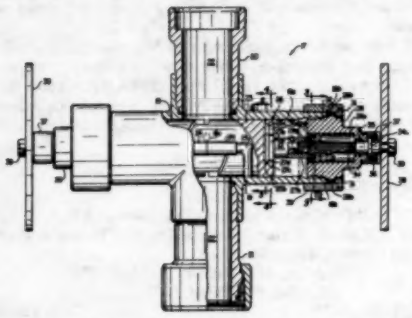
Filed Oct. 2, 1989, Ser. No. 415,968
Int. Cl.[5] E21B *33/06*
U.S. Cl. 251—1.3 **8 Claims**

1. A blowout preventer comprising:

(a) a body having a passageway for line therethrough, said body also having opposed bores intersecting said passageway;

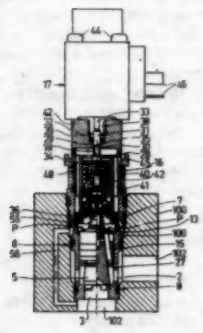
(b) invertible end bodies closing each bore;

(c) means for positioning said end bodies upright or inverted;
(d) a ram having an inner seal mounted in each bore;
(e) means for keying said rams to said end bodies including, an opening in the outer end of each ram, said opening having parallel flat surfaces on opposed sides and an inner groove, said groove having opposed parallel flat surfaces parallel with said opening flat surfaces, a sleeve slidably mounted in each said end body, said sleeve having a round end surface and a groove with parallel flat surfaces on opposed sides of said groove adjacent said round end



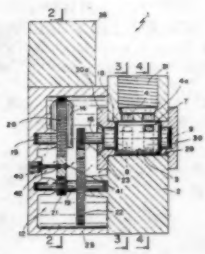
surface and upper and lower flat surfaces on said sleeve, and upper and lower cross pins, each having a flat surface, said cross pins retained in each of said end bodies and said upper pin flat surface slidably engaging said upper sleeve flat surface and said lower pin flat surface slidably engaging said lower sleeve flat surface; and
(f) means for moving each ram between open position not sealing and closed position where said inner ram seals seal on each other and around any line in said body passageway and close said passageway to flow.

4,964,611
VALVE FOR PRESSURIZED MEDIA
Bo Andersson, Skellefteå , Sweden, assignor to Bahco Hydrauto AB, Skellefteå, Sweden
Filed Nov. 14, 1989, Ser. No. 435,704
Claims priority, application Sweden, Nov. 15, 1988, 8804116
Int. Cl.[5] F16K *31/12*
U.S. Cl. 251—30.02 **9 Claims**



1. A valve for pressurized media, in the outer configuration of a cartridge which can be screwed into a valve block (100) for connecting the valve to a pressurized medium duct in the valve block, said valve including a valve housing formed as a sleeve-like portion of said cartridge, provided with inlet and outlet and screwable in the valve block, there being arranged in said housing a main valve plug which is infinitely variably displaceable for infinitely variable control of a pressurized medium flow through the valve in said pressurized medium duct with the aid of a pilot flow originating from the pressurized medium flow and controllable by a pilot flow control valve, said pilot flow passing through a variable pilot flow throttling means (26) situated in the main valve plug, characterised in that the pilot flow control valve (18) is arranged in an end piece (39) formed as a lid on said cartridge sleeve, and adapted for opening or closing a pilot flow duct (15, 16) inside the cartridge in response to a control signal, and in that after the pilot flow throttling means (26) in the main valve plug (5), but before the pilot flow control valve (18), there is arranged a pressure compensation means (54) in said pilot flow duct (15, 16), this means (54) being disposed movably in a cylinder and spring biased to an open position, the opposing ends of said pressure compensation means (54) being under the action of the pressure prevailing in the pilot flow duct after the variable pilot flow throttling means (26), and in addition being under the action of a piston (78), said piston sensing the pressure in the valve inlet and/or outlet and being arranged movably in the end portion of the main valve plug facing away from the valve outlet, for throttling or interrupting the pilot flow before the pilot flow control valve (18) in response to pressure alterations in the inlet or outlet.

4,964,612
ELECTROMAGNETICALLY-OPERATED ROTARY SERVOVALVE
Virginio Maggioni, Rosta, and Vittorino Torrielli, Turin, both of Italy, assignors to Fiat Auto S.p.A., Turin, Italy
Filed May 8, 1989, Ser. No. 348,360
Claims priority, application Italy, May 10, 1988, 53128/88[U]
Int. Cl.[5] F16K *31/10*
U.S. Cl. 251—129.09 **7 Claims**



1. An electromagnetically operated servovalve in particular for controlling an actuator in an active vehicle suspension, characterized by comprising in combination:
(a) a valve body provided with a seat and at least one series of respective radial ducts disposed angularly spaced apart and opening into said seat;
(b) a rotary distributor disposed idly and in a fluid-tight manner within said seat, and provided with at least one through transverse bore and arranged selectively, depending on its angular position, to block off said radial ducts or to connect them together in pairs;
(c) a pair of linear electromagnetic actuators;
(d) transmission means mechanically connecting said electromagnetic actuators to said rotary distributor, said transmission means being arranged to convert, with a predetermined step-up ratio, the linear motion of said actuators into rotary motion of said distributor,
(e) said linear electromagnetic actuators are disposed side-by-side and parallel, perpendicular to the axis of rotation of said rotary distributor and each comprises a solenoid and an internally hollow core mounted axially slidable within the respective solenoid; and

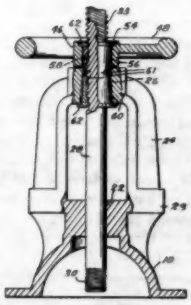
(f) said transmission means comprise a rocker system in which slide rods connect said electromagnetic actuators to opposite sides of a first control shaft, a second control shaft connected angularly rigid with and coaxial to said rotary distributor and projecting axially from one end of said seat, an intermediate shaft disposed parallel to said first and second control shaft, and a train of gears fixed angularly rigid onto said shafts and mutually engaging in pairs.

4,964,613

GATE VALVE

Timothy M. Lognan, Monticello, Ill., assignor to Mueller Co., Decatur, Ill.

Filed Oct. 18, 1989, Ser. No. 423,155
Int. Cl.[5] F16K *31/50*
U.S. Cl. 251—267 **5 Claims**



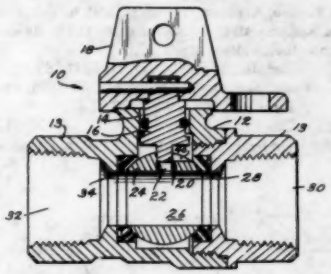
1. In a valve apparatus of the type including a valve housing having a through passage, a valve member mounted for movement relative to said passage between an open position where flow through the passage is permitted and a closed position where flow through the passage is prevented, operating means for said valve member comprising a support means carried on the exterior of said housing, a valve stem having a longitudinal axis, a threaded portion adjacent one end thereof and another portion connected to said valve member so that movement of said valve stem relative to said support means effects movement of said valve member between said open and closed positions, said support means further comprising a bore having a longitudinal axis with said threaded portion of said valve stem extending through said bore, actuating means for moving said stem relative to said bore in a direction parallel to said longitudinal axis of said bore, said actuating means including a rotatable member disposed exteriorly of said bore and surrounding said valve stem, a first nut means operatively connected to said rotatable member so as to be rotatable therewith, a second nut means disposed in said bore and carried on said valve stem, said first and second nut means having interengaging means preventing relative rotation therebetween and each having threaded interior portions for threadly engaging adjacent sections of said threaded portion of said valve stem, said first and second nut means having each first and second ends with the second ends of said first and second nut means having said interengaging means thereon, said interengaging means comprising tangs extending from said respective second ends of said first and second nut means.

4,964,614

METHOD FOR FORMING A BALL VALVE CONNECTION AND STRUCTURE

Robert E. Sands, Shelbyville, and Carl E. Floren, Decatur, both of Ill., assignors to Mueller Co., Decatur, Ill.

Filed Oct. 2, 1989, Ser. No. 415,615
Int. Cl.[5] F16K *5/06*
U.S. Cl. 251—315 **8 Claims**



1. A ball valve assembly having a ball member, said ball member having a substantially spherical surface and a through bore formed therein extending substantially along a diameter of said ball member, said through bore being defined by a curved surface having a selected radius of curvature, an arcuate slot means being formed in said spherical surface for receiving an operating stem, said arcuate slot means having a curved bottom wall, said arcuate slot means extending into said spherical surface such a distance that said arcuate slot means intersects said through bore to form an opening from said arcuate slot means into said through bore.

4,964,615

COMPOSITIONS FOR FREEING JAMMED DRILL PIPES

Heinz Mueller, Monheim; Claus-Peter Herold, Mettmann, and Stephan von Tapavicza, Erkrath, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed May 25, 1988, Ser. No. 198,428
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1988, 3801476
The portion of the term of this patent subsequent to Feb. 7, 2006, has been disclaimed.
Int. Cl.[5] E21B *31/00*; C09K *7/06*
U.S. Cl. 252—8.551 **15 Claims**

1. A liquid composition free from mineral oil, for freeing jammed drill pipes comprising:

(a) from about 80 to about 95% by weight of a fatty acid alkyl ester or mixture of esters of the formula:

$$R^1-\overset{\overset{O}{\|}}{C}-OR^2$$

wherein R^1 is a linear C_7–C_{30} alkyl alkenyl or alkandienyl radical and R^2 is a linear or branched alkyl or hydroxyalkylene radical having from 1–8 carbon atoms wherein the ester or mixture of esters has a pour point not higher than about −15° C.;

(b) from about 0.5 to about 5% by weight of at least one oleophilic bentonite thickener; and

(c) from about 1 to about 10% by weight of an emulsifier system of at least one emulsifier selected from the group consisting of polyamines, aminoamides, low alkoxylated alkylphenols and imidazolines and mixtures thereof and at least one coemulsifier selected from the group consisting

of fatty acids, calcium salts of fatty acids; alkyl sulfonic acids, calcium salts of alkyl sulfonic acids, alkylbenzene sulfonic acids, calcium salts of alkylbenzene sulfonic acid and mixtures thereof.

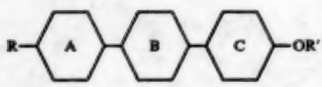
4,964,616

TRICYCLIC CYCLOHEXENYL CYCLOHEXANE DERIVATIVE

Yasuyuki Tanaka; Kiyofumi Takeuchi, both of Tokyo, and Yuji Tamura, Saitama, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

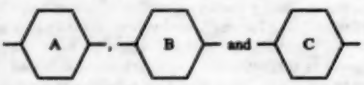
Filed Jul. 18, 1989, Ser. No. 381,357
Claims priority, application Japan, Jul. 19, 1988, 63-178086
Int. Cl.[5] C09K *19/30*; C07C *41/00*
U.S. Cl. 252—299.63 **12 Claims**

1. A compound represented by the following general formula (I):

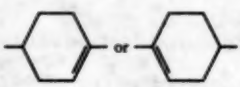


(I)

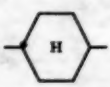
wherein R represents a straight-chain alkyl group having 1 to 9 carbon atoms; R' represents a straight-chain alkyl group having 1 to 9 carbon atoms or a trans-crotyl group; one of



ring represents a



ring while other two groups represent each a



group; and the cyclohexane groups are arranged at a trans-configuration.

4,964,617

REMOVABLE EXTENSION FOR A HYDRAULIC FLOOR JACK

W. Edward Lawrence, 2323 W. Bay Area Blvd., No. 901, Webster, Tex. 77598

Filed Sep. 22, 1989, Ser. No. 410,747
Int. Cl.[5] B60P *1/48*
U.S. Cl. 254—8 B **3 Claims**

1. A hydraulic floor jack comprising:

a body having rollers for contacting a supporting surface;

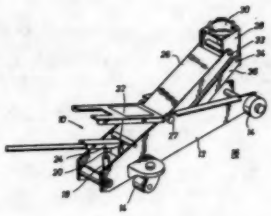
a lifting arm pivotally connected to said body for movement between an upper extended position and a lower retracted position;

manually operated hydraulic fluid means operatively connected to said lifting arm for raising said lifting arm to an extended position;

a generally U-shaped mounting bracket on the extending end of said lifting arm including an upper horizontal web having a central opening therethrough and a pair of spaced downwardly extending integral legs;

a saddle removable mounted on the upper horizontal web of said bracket and adapted to contact the underside of a vehicle body for raising the vehicle body upon movement of the lifting arm in an upward direction; and

an improved extension of a predetermined height for mounting on said upper horizontal web upon removal of said saddle, said extension comprising a vertically extending tubular cylindrical body, an upper integral horizontal plate closing the upper end of said tubular body and extending laterally of said body to form an annular flange overhanging the body, said plate having an upper planar supporting surface for contacting the underside of the vehicle body, a lower integral horizontal plate closing the lower end of said tubular body and having an integral pin extending downwardly therefrom, said pin fitting within said opening of said horizontal web with said lower plate supported on the upper surface of said web, and means securing said pin within said opening of said web, whereby upon raising of said lifting arm said upper plate is adapted to contact the underside of a vehicle body for lifting of said vehicle body.

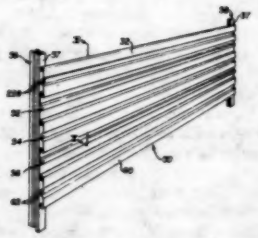


4,964,618

FENCE SYSTEM AND COMPONENTS

Charles G. Kennedy; Patrick D. McKeown, both of Mansfield, and Jack W. Neiger, Tuscarawas, all of Ohio, assignors to Cyclops Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 142,851, Dec. 11, 1987, abandoned.
This application Oct. 10, 1989, Ser. No. 420,613
Int. Cl.[5] E04H *17/16*
U.S. Cl. 256—24 **15 Claims**



1. A fence system comprising:

fence post means for being vertically mounted; and

a plurality of interconnected fence rail means for being horizontally mounted and for being connected to said fence post means, each said fence rail means comprising:

(a) an elongated rail member defining a longitudinal axis for being horizontally disposed and an axis which is transverse to said longitudinal axis and having a first end, a second end, a third end and a fourth end, said first and second ends being positioned at opposite ends of

said longitudinal axis of said elongated rail member and said third and fourth ends being positioned at opposite ends of said transverse axial;

(b) said third and fourth ends each being generally symmetrical with one another;

said third and fourth ends each having an extreme end portion;

each said extreme end portion being formed in sequence a first bend closest to its corresponding extreme end portion, a second bend adjacent said first bend, a third bend adjacent said second bend, and a fourth bend furthest away from its corresponding end portion, each said bend extending generally continuously from said first end to said second end, said first bend being formed at an acute angle, said second bend being formed at an obtuse angle and said third and fourth bends each being formed at a right angle;

(c) said third and fourth ends each defining a cavity and forming an interlocking connector for slidingly interconnecting one of said third and fourth ends of a first of said plurality of rail means with one of said third and fourth ends of a second of said plurality of rail means, said acute angle of said first bend, said obtuse angle of said second bend, said right angle of said third bend and said right angle of said fourth bend being relatively positioned to face their corresponding cavity; and

(d) said elongated rail having means for attachment to said fence post means.

4,964,619

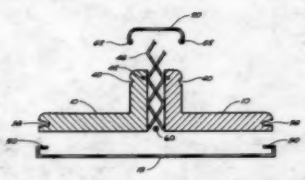
FENCE FRAME

Allen L. Glidden, Jr., P.O. Box 444, Bridge City, Tex. 77611

Filed Dec. 18, 1989, Ser. No. 452,797

Int. Cl.[5] E04H *17/06*

U.S. Cl. 256—32 **13 Claims**



1. An elongated substantially rigid vegetation barrier for eliminating vegetation adjacent to and beneath a chain-link or similar fence, said barrier comprising:

a. a horizontal base section and a vertical upper section containing a plurality of longitudinal grooves;

b. a series of base brackets in direct communication with a longitudinal groove in an outer base section of said barriers, thereby eliminating itinerancy of said barriers;

c. a series of upper external spring clip brackets corresponding with said base brackets and communicating with a longitudinal groove in an upper outer section of said barriers, thereby creating bilateral inward pressures along said barriers and against said fence, thus rendering said barriers immobile and affixed to said fence;

d. a series of barrier conforming overlapping covers to seal and splice the abutments of adjacently aligned or perpendicularly intersected said barriers.

4,964,620

METHOD OF MANUFACTURING WEATHERSTRIP

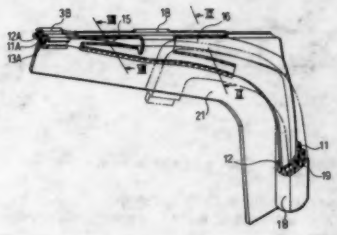
Masayuki Omura, Tsushima, and Mitsuo Hamabata, Bisai, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jul. 20, 1989, Ser. No. 382,290

Claims priority, application Japan, Aug. 10, 1988, 63-199623

Int. Cl.[5] B29C *45/16, 65/70*

U.S. Cl. 264—261 **2 Claims**



1. A method of manufacturing a weatherstrip comprising the steps of

(a) providing a first extruded component and a second extruded component, each having surfaces treated portions,

(b) inserting and setting in a mold the first extruded component and the second extruded component so as to define with the mold a mold cavity for forming a molded corner portion,

(c) setting, in the mold cavity a third extruded component cut to a length less than a length of the mold cavity, said third extruded component having surface treated portions and being formed with separating slits extending along at least first and second opposed lateral surfaces from each end of said third extruded component to an intermediate section thereof, in such a manner that the surface treated portions of the third extruded component are in line with respective surface treated portions of the first and second extruded components, and

(c) forcing molding material into the mold cavity to mold a molded connecting portion inclusive of the third extruded component, thereby connecting the first extruded component and the second extruded component by means of the molded connecting portion.

4,964,621

APPARATUS FOR HEAT TREATING A CARBON STEEL WIRE

Andre Reiniche, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Division of Ser. No. 122,113, Nov. 18, 1987. This application Feb. 9, 1989, Ser. No. 308,871

Claims priority, application France, Nov. 27, 1986, 86 16705

Int. Cl.[5] C21D *9/62, 11/00*

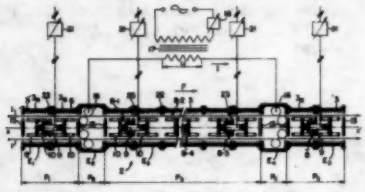
U.S. Cl. 266—90 **13 Claims**

1. Apparatus for heat treating a continuous carbon steel wire to obtain a fine pearlite structure, said apparatus comprising:

(a) means defining a first enclosure through which a carbon steel wire which has been previously maintained at a temperature above the AC_3 transformation temperature is transported and including therein means for cooling the wire to a given temperature which is below the AC_1 transformation temperature and above the temperature of the nose of the curve of the start of the transformation of metastable austenite into pearlite, the wire as it exits said first enclosure having a metastable austenite structure without pearlite;

(b) means defining a second enclosure downstream of said first enclosure and including therein means for regulating

the temperature of the wire to not more than 10° C. above or below said given temperature for a period of time greater than the pearlitization time, said regulating means comprising means for passing an electric current through the wire for heating the wire and means for providing



modulated ventilation of the wire for cooling the wire; and

(c) means defining a third enclosure downstream of said second enclosure and including therein means for cooling the wire.

4,964,622

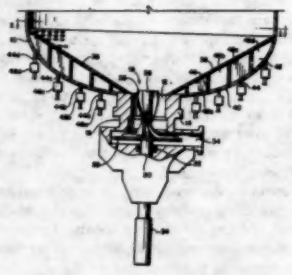
LEACHING VESSEL AND SLURRY FLOW CONTROL

Michael I. Sherman, Glens Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed Aug. 8, 1989, Ser. No. 390,902

Int. Cl.[5] C22B 3/02

U.S. Cl. 266—168 **18 Claims**



1. Apparatus for treating slurries comprising:

an upright vessel for containing the slurry;

means defining an inlet for flowing a treatment solution into the vessel and into the slurry including an inclined wall adjacent the bottom of the vessel, said inclined wall having a plurality of apertures therethrough;

means defining an outlet for the slurry adjacent the bottom of said vessel; and

a pump disposed to pump slurry from the vessel through said outlet;

said wall being inclined toward said outlet to deliver slurry thereto.

4,964,623

FLUID FILLED RESILIENT BUSHING

Richard P. Thorn, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Dec. 7, 1987, Ser. No. 129,614

Int. Cl.[5] F16F 9/10; F16M 7/00

U.S. Cl. 267—140.1 **12 Claims**

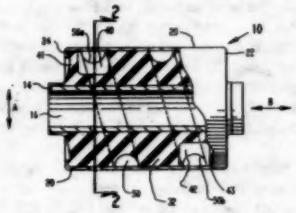
1. A fluid filled resilient bushing assembly comprising:

an elongate inner rigid member substantially concentric about a central longitudinal axis;

an elongate outer rigid cylindrical sleeve member disposed about and radially spaced from said inner member to define a space therebetween;

a resilient means disposed about said inner member between said inner rigid member and said outer sleeve member;

said resilient means defining at least two spaced chambers interconnected by a restricted passageway, said chambers being spaced both circumferentially and in the direction of said longitudinal axis; and



an incompressible fluid filling said spaced chambers and said restricted passageway;

wherein said bushing assembly provides damping of vibratory motion due to fluid motion along said longitudinal axis and the radial direction and combinations of longitudinal and radial directions.

4,964,624

RESILIENT SUPPORTS WITH COMPOSITE CABLES EMBEDDED IN ELASTOMERIC MATERIAL

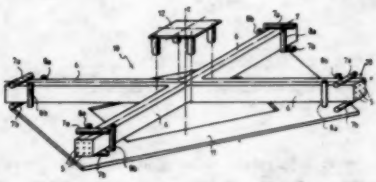
Jean-Pierre Ciolczyk, Montargis, and Jean-Michel Simon, Clamart, both of France, assignors to Hutchinson, Paris, France

Filed Jun. 16, 1988, Ser. No. 207,693

Claims priority, application France, Jun. 23, 1987, 87 08809; Nov. 24, 1987, 87 16240

Int. Cl.[5] F16F 3/10, 1/36, 1/18; F16M 13/00

U.S. Cl. 267—81 **14 Claims**



1. A resilient support for machinery and equipment which is characterized by the ability to deflect isotropically in at least two axes and absorb shock, said support comprising:

a plurality of arms extending symmetrically outwardly from a central axis of symmetry, the outward extent of each arm lying in a substantially common plane, and each arm being formed of an elastomer material and including a plurality of composite cables embedded within the elastomer material and extending parallel to the longitudinal axis of the arm along the outward extent of the arm; and

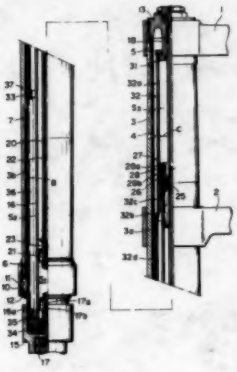
a fixing device cooperating with outward end portions of each of said arms for connecting the arms to a support structure.

4,964,625

HYDRAULIC DAMPER WITH OIL LOCK MECHANISM

Sadao Kawamura, Hamamatsu, Japan, assignor to Kabushiki Kaisha Showa Seisakusho, Tokyo, Japan

Filed Jul. 12, 1988, Ser. No. 218,085
Claims priority, application Japan, Jul. 14, 1987, 62-176606
Int. Cl.[5] F10F 5/00; F16F 1/48
U.S. Cl. 267—221 5 Claims



1. An hydraulic damper comprising:

an outer tube having a closed upper end and adapted to be coupled to a vehicle frame;

an inner tube having a closed lower end and slidably inserted in said outer tube;

a cylinder coaxially disposed in said inner tube and movable with the inner tube;

a piston rod inserted in said cylinder and movable with said outer tube;

a piston fixed to a distal end of said piston rod an held in sliding contact with an inner peripheral surface of said cylinder;

a coil spring disposed in said inner tube; and

an oil lock mechanism for preventing bottoming when the hydraulic damper is fully compressed, said oil lock mechanism comprising an oil lock piece mounted on an upper end of said cylinder, and an oil lock tube disposed concentrically between said cylinder and said inner tube and having a larger-diameter portion radially spaced from said oil lock piece when the hydraulic damper is extended and a smaller-diameter portion in sliding contact with an outer peripheral surface of said oil lock piece for substantially preventing the flow of working oil when the hydraulic damper is compressed.

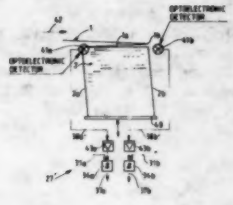
4,964,626

APPARATUS FOR STACKING PAPER WEBS IN ZIG-ZAG FORMATIONS

Karl-Heinz Schlottke, Tangstedt, Fed. Rep. of Germany, assignor to E.C.H. Will GmbH, Hamburg, Fed. Rep. of Germany

Filed Feb. 10, 1989, Ser. No. 309,426
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1988, 3804366
Int. Cl.[5] B41L 1/32
U.S. Cl. 270—39 28 Claims

1. Apparatus for transforming a continuous web, particularly a paper web, into a series of stacks of overlapping panels, comprising means for advancing the web in a predetermined direction along a predetermined path; means for weakening spaced-apart transversely extending portions of the web in a first portion of said path to thus convert the web into a succession of coherent panels with transversely extending weakened portions between neighboring panels, including means for cyclically weakening the web in said first portion of said path at a predetermined frequency; means for subjecting the web to a predetermined tensional stress in the first portion of said path; means for gathering the panels into a series of substantially upright stacks, with the panels of the stacks in zig-zag formations, in a second portion of said path wherein some of the stacks tend to assume non-upright positions; and means for altering the tensional stress upon the web in the first portion of said path to thus counteract the tendency of stacks to assume



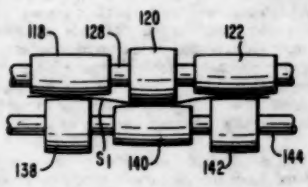
non-upright positions, said altering means including means for increasing the tensional stress upon the web at a predetermined fraction of said frequency and said means for increasing the tensional stress including control means having means for generating first signals in response to weakening of the web by said weakening means, means for generating second signals on detection of non-upright stacks, and means for converting at least some of said first and second signals into third signals, said altering means further comprising means for stretching the web in response to said third signals.

4,964,627

APPARATUS AND METHOD FOR FORMING SIGNATURES INTO A V-CONFIGURATION

Leonard A. Watts, North Miami Beach, and Medardo Espinosa, Hialeah, both of Fla., assignors to EDS Technologies, Inc., Hialeah, Fla.

Filed Jan. 26, 1989, Ser. No. 301,905
Int. Cl.[5] B65H 29/12, 29/70
U.S. Cl. 271—188 18 Claims



1. Apparatus for transporting signatures along a path between two conveyors from an upstream location to a downstream location and forming the signature into a V-shaped configuration, comprising:

a first conveyor having a first plurality of rollers coaxially mounted along a first axis transverse to the path, the first plurality of rollers having circumferential surfaces and different diameters which define a V-shape, and a first plurality of endless loop members mounted to travel along the path and pass respectively over the circumferential surfaces of the first plurality of rollers for transporting the signatures along the path;

a second conveyor having a second plurality of rollers coaxially mounted along a second axis transverse to the path, the second plurality of rollers having respective circumferential surfaces opposed to the respective circumferen-

tial surfaces of the first plurality of rollers, the second plurality of rollers having diameters complementary to the first plurality of rollers to also define the V-shape, and a second plurality of endless loop members opposed to the first plurality of endless loop members and mounted to travel along the path and pass respectively over the circumferential surfaces of the second plurality of rollers for transporting the signatures along the path; and

driving means for driving the first and second endless loop members at substantially identical speeds.

4,964,628

HIP-RECIPROCATING APPARATUS

Christopher Poplawski, Redwood City, Calif., assignor to Center for Orthotics Design, Inc., Redwood City, Calif.

Filed Jun. 30, 1989, Ser. No. 375,210

Int. Cl.[5] A63B *23/04*

U.S. Cl. 272—70 **16 Claims**

1. An apparatus positionable adjacent to the hips of a human body for facilitating walking and standing balanced comprising:

a base member including a hip portion positionable adjacent to each hip of a human body, wherein the base member extends from one hip to the base member extends from one hip to the other hip when positioned for use;

a pivot member pivotally mounted on the base member, the pivot member including an opposing end extending adjacent to each base member hip portion when positioned for use, whereby the pivot member ends move in opposite directions with pivoting of the pivot member;

a leg member pivotally attached to each hip portion of the base member and extending along the human leg, when positioned for use, for pivoting relative to the base member about an axis extending laterally of the base member; and

linkage means coupling each pivot member end with the associated leg member for coordinating the pivoting of the two leg members when the pivot member pivots relative to the base member.

4,964,629

KARATE KICK EXERCISE APPARATUS

Jerry F. Wright, 718 Manfield Dr., Newark, Del. 19713

Filed Mar. 9, 1989, Ser. No. 321,100

Int. Cl.[5] A63B *69/00, 21/06*

U.S. Cl. 272—76 **11 Claims**

1. Apparatus useful in practicing a karate kick comprising:

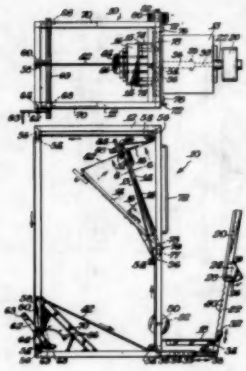
(a) a frame,

(b) a vertically adjustable platform affixed externally to said frame,

(c) a rotatable slide assembly having a forward end and a rear pivot end, the rear pivot end affixed to said frame adjacent said platform, the slide assembly extending internally within said frame,

(d) foot slide block means slideably engaged in said slide assembly so as to slide from an initial rest position adjacent said rear pivot end to a final fully-extended position adjacent said forward end of said slide assembly, and

(e) resistance means comprising a tension member and pulley assembly affixed to said slide block assembly and to said frame which resist movement of said slide block assembly from said initial rest position to said final fully-extended position,



whereby, when a user stands on one foot on said platform, suitably adjusted for said user's height, and places his other foot on said foot slide block means in said initial position and gives a kick, said slide block means slides in said slide assembly to said final position restrained by said resistance means, said resistance means acting to rotate said slide assembly upwardly about a horizontal pivot axis thereby giving the user exercise for those muscles specifically associated with the kick.

4,964,630

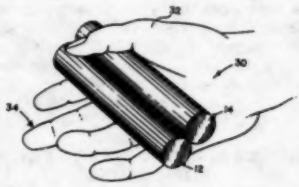
EXERCISE DEVICE

Harold H. Curtiss, 851 Pool Rd., Biddeford, Me. 04005

Division of Ser. No. 103,680, Oct. 2, 1987. This application Feb. 24, 1989, Ser. No. 315,157

Int. Cl.[5] A63B *5/00, 21/06*

U.S. Cl. 272—93 **8 Claims**



1. An exercise device suitable for use in the palm of one's hand and being capable of providing a full range of motion for the finger flexors, abductors, adductors, and the thumbs, adductors, and opposing muscles of the thumb and fifth digit comprising in combination two elongated, cylindrical-shaped members each of the same predetermined diameter, length, and weight, each said elongated member comprising an elongated tubular-shaped member defined by first and second ends and defining an elongated hollow internal core, particulate mass bearing material being provided within said internal core for providing weight to the said elongated member, and an end cap being provided on said elongated tubular-shaped member at each of its ends for containment of the particulate mass

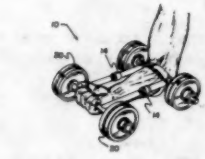
bearing material comprising the core, the said two elongated members being capable of being rotated one over the other by the manipulation of one's fingers against said elongated members, each of said tubular-shaped members being characterized by the inability to create static electricity when rotated one against the other, and each said tubular-shaped member comprising a non-rusting material having a smooth outer peripheral surface characterized by a relatively low coefficient of friction whereby to facilitate the rotation of one said elongated member against and over the other when the device is palmed in one's hand and used in the exercise of one's hand and fingers.

4,964,631

PORTABLE EXERCISING SET

Walter Marano, 2462 Oceanside Rd., Oceanside, N.Y. 11572

Filed Sep. 27, 1989, Ser. No. 413,091
Int. Cl.[5] A63B *21/06*
U.S. Cl. 272—117 **6 Claims**



1. A set of portable exercising devices for separate and individual use by the arms and legs, one of said devices comprising a rectangular frame fabricated from a plurality of solid and tubular cross-sectional metal members, said frame having means for adjusting the length of the longer sides of said rectangulr frame to enable the hand of the exercising person to grasp one of the shorter sides of said rectangular frame, and a circular padded brace positioned in proximity to the shorter side opposite that shorter side grasped by said hand for attaching the brace and said frame to the arm; the other one of said devices comprising a rectangular frame fabricated from a solid and tubular cross-sectional metal member, said frame having means for adjusting the length of the longer side of said rectangular frame to the length of the exercising person's leg and to enable the foot of the exercising person to rest upon a shorter side of said rectangular frame amd a plurality of circular padded braces for attaching said rectangular frame to said leg; each rectangular frame having means for attaching weights in proximity to its corners.

4,964,632

COMPACT MULTI-FUNCTION WEIGHT-TRAINING EXERCISER

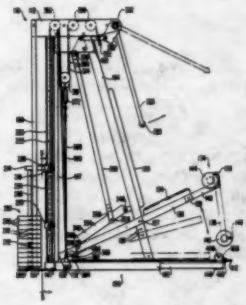
Gary L. Rockwell, Auburn, Ala., assignor to Diversified Products Corporation, Opelika, Ala.

Filed Sep. 6, 1989, Ser. No. 403,404
Int. Cl.[5] A63B *21/062*
U.S. Cl. 272—118 **11 Claims**

1. In a physical exercising apparatus having a frame; a vertically guided liftable weight assembly on said frame; a seat and a backrest on said frame; at least one moveable handlebar lever pivoted at its upper end relative to said frame about a transverse axis located above said backrest and having a handgrip at its lower end that can be grasped and pushed forwardly by a user seated on the seat with his back against the backrest to perform a seated chest press exercise; and actuating means including a cable and pulley arrangement operatively interconnecting said handlebar lever and said weight assembly whereby pivotal movement of said handlebar lever during exercise raises and lowers said weight assembly, the improvement wherein said actuating means comprises:

a lower lever behind said backrest pivoted at one end to said frame;

an upwardly extending lift member behind said backrest pivoted at its lower end to the medial portion of said lower lever;



motion converting means for converting forward pivotal movement of said handlebar lever to upward movement of said lift member, and vice versa;

a primary upper pulley on said frame above said weight assembly;

a primary lower pulley on said frame; and

cable means interconnecting said weight assembly and the distal end of said lower lever, and trained around said primary upper and primary lower pulleys, for raising and lowering said weight assembly, whereby pivotal movement of said handlebar lever raises said lift member and said lower lever and pulls said cable means, thereby lifting said weight assembly.

4,964,633

ISOKINETIC OSCILLATING EXERCISE APPARATUS

Bruce Hymanson, P.O. Box 5100, Playa del Rey, Calif. 90256

Filed Oct. 28, 1988, Ser. No. 263,820
Int. Cl.[5] A63B *21/002*
U.S. Cl. 272—125 **2 Claims**

1. An isokinetic oscillating exercise apparatus comprising a flat, elongated strip of material having gripping portions attached to a middle portion thereof, said flat, elongated strip of material being flexible and adapted to oscillate in response to said gripping portions being grasped by a user and shaken back and forth causing opposite ends of said elongated strip of material to oscillate, resulting in sufficient resistance for isoki-

netic exercising of some of said user's muscles, said flat, elongated strip of material being about 5 feet 2 inches long, about

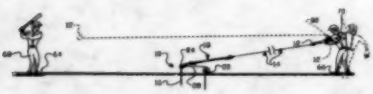
2 inches wide, about 7/64 inches thick, and oscillating in the range of about three to about seven cycles per second.

4,964,634

TETHERED BALL BATTING PRACTICE DEVICE

Ralph Boyer, Crystal City, Mo., assignor to Incrediball, Inc., Concord, Calif.

Filed Apr. 17, 1989, Ser. No. 339,383
Int. Cl.[5] A63B *69/00*
U.S. Cl. 273—26 E **8 Claims**



1. In a batting practice device including a ball, cord means having a first end attached to said ball, and primary anchor means secured to a second end of said cord means opposite said first end for anchoring said ball at an anchoring position between a pitcher and a batter, said cord means having an elastic portion for propelling said ball by stretching said elastic portion in a direction away from said primary anchor, wherein the improvement in said batting practice device comprises:

an auxiliary anchor means coupled proximate said second end of said cord means to one of said primary anchor means and said second end and limiting propulsion of said primary anchor by said elastic portion in a direction toward said first end, said auxiliary anchor means further being coupled in a manner which does not limit stretching of said elastic portion during propulsion of said ball.

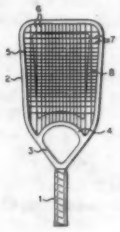
4,964,635

TENNIS RACKET

Gary C. Fitzgerald, 22 Francis St., Westfield, Mass. 01085

Filed Apr. 14, 1989, Ser. No. 337,899
Int. Cl.[5] A63B *49/02*
U.S. Cl. 273—73 C **4 Claims**

1. In a tennis racket comprised of a handle connecting to a frame, providing an open playing head having a first set of strings spanning in a substantially longitudinal direction interlaced with a second set of strings spanning in a substantially transverse direction, the improvements characterized by: means of a substantially V-shaped open throat and inverted open bridge connecting to said open playing head; and means embodied in said frame for mounting a plurality of longitudinal strings in such a manner that they successively increase in length outward from the longitudinal axis, and a plurality of transverse strings in such a manner that they successively increase in length from the geometric center of the head toward the tip, whereby the improvements provide an enlarged area of optimum spring back effect extending outward toward the sides of the head and upward toward the tip, an increase in the stability of the of the racket, the center of percussion located closer to the geometric center of the head, and the vibration levels on off-center hits being reduced.

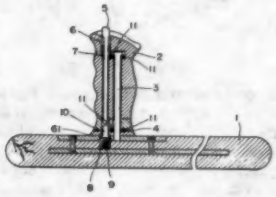


4,964,636

POLICE BATON WITH ROTATABLE CROSSHANDLE

Hideyuki Ashihara, Matsuyama, Japan

Filed Feb. 21, 1989, Ser. No. 312,988
Claims priority, application Japan, Feb. 23, 1988, 63-41573; Sep. 5, 1988, 63-223098; Jan. 11, 1989, 1-5485
Int. Cl.[5] F41B *15/02*
U.S. Cl. 273—84 R **22 Claims**



1. A crosshandled guard baton which comprises:

a club having a longitudinal axis;

a crosshandle transversely branched on the club at a place toward one end of said club, said crosshandle having a cross-section of elliptic shape with the major axis of the elliptic shape substantially parallel to the longitudinal axis of said club and a branching length substantially equal to the width of a man's palm;

a shaft rotatably supported internally of said crosshandle, one end of said shaft being secured to a mounting base formed on said club and providing a rotary slide plane between said crosshandle and said mounting base;

a rod provided internally of said crosshandle and having a round tip adjacent to the club, said rod having an axis parallel to said shaft and being axially movable relative to said crosshandle;

a pin mounted in a bore formed in said club and a coil spring biasing said pin coaxially into abutment with the round tip of the rod internally of said crosshandle;

whereby said pin is biased by said coil spring to extend across said slide plane and prevent turning movement of the club and said pin is movable by axial movement of the rod to a position flush with said slide plane to permit turning movement of said club relative to the crosshandle.

4,964,637

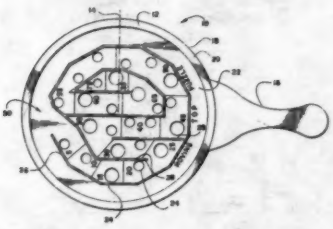
ROVING SPINNING TOP PUZZLE

Paul Gebert, 4 Benham Clr., Cartersville, Ga. 30120

Filed Jun. 27, 1989, Ser. No. 371,924

Int. Cl.[5] A63B *67/14*

U.S. Cl. 273—113 **4 Claims**



1. An apparatus, comprising:

a base member having a gaming surface;

an elongated divider on said gaming surface;

an orbital pathway on said base adjacent said gaming surface;

a plurality of lateral ribs extending from said divider, said divider and said lateral ribs defining a single pathway between first and second locations of said orbital pathway;

a handle attached to said base;

a rotatable top member; and

a spindle attached to said top member and extending perpendicular thereto and being of a size and configuration sufficient for riding in said orbital pathway and traversing said gaming surface as said top member rotates, the speed at which said top member rotates increasing in response to reciprocating movement of said handle.

4,964,638

CONTROL APPARATUS FOR GAME MACHINES

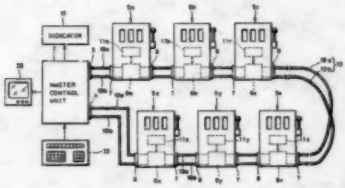
Naomi Ishida, Tokyo, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

Filed May 16, 1989, Ser. No. 352,541

Claims priority, application Japan, May 16, 1988, 63-118586

Int. Cl.[5] A63B *71/00*

U.S. Cl. 273—138 A **13 Claims**



1. An apparatus for controlling a group comprised by a plurality of game machines each of which has pay-out means for paying out coins according to the kind of win, said apparatus being provided with means for indicating a pay-out value for a particular win, said apparatus comprising:

first calculating means for calculating a first accumulation value by accumulating, at a first rate, the value of coins inserted into each of said game machines;

second calculating means for calculating a second accumulation value by accumulating, at a second rate, the value of said inserted coins; and

controlling means for ordering said indicating means to indicate one of said first and second accumulation values as said pay-out value, for ordering said pay-out means of a said game machine in which said particular win occurs to pay out coins of a number which corresponds to said pay-out value, and for ordering said indicating means to indicate the other of said first and second accumulated values as said pay-out value after said particular win occurs.

4,964,639

GOLF PUTTER

Richard B. C. Tucker, Baltimore, Md., assignor to Wm. T. Burnett & Co., Inc., Baltimore, Md.

Continuation of Ser. No. 186,334, Sep. 11, 1980, abandoned, which is a continuation-in-part of Ser. No. 22,031, Mar. 19, 1979, abandoned, which is a continuation-in-part of Ser. No. 920,062, Jun. 28, 1978, abandoned. This application Feb. 9, 1984, Ser. No. 578,421

Int. Cl.[5] A63B *53/04, 69/36*

U.S. Cl. 273—164 **10 Claims**

1. A golf putter comprising a head and a single substantially straight shaft connected to said head only at a single location on said head, said head including a face having a width greater than its height, said face having a generally convex base; a top surface which is generally concave or convex, and said base and top surface being joined by two ends; said single shaft connected to said head generally midway of the width thereof and at an angle of at least ten degrees to a vertical line extending through the center of a horizontal line extending across said face of said putter, said top surface of the face overlying said base and extending substantially the full width of the face, said top surface and said two ends, together with said single shaft, defining masking means whereby the head, when the shaft is in a substantially vertical position and viewed from the top of the putter, gives a visual impression of having the lowest point of the base of the face of the putter substantially in axial alignment with said shaft.

4,964,640

IRON CLUB HEAD FOR GOLF

Tatsuo Nakanishi; Toyohiko Tadokoro, and Masaki Fujimura, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan

Division of Ser. No. 355,665, May 23, 1989, Pat. No. 4,928,972, which is a continuation-in-part of Ser. No. 70,906, Jul. 8, 1987, abandoned. This application Jan. 30, 1990, Ser. No. 472,203

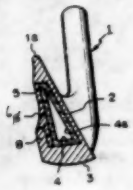
Claims priority, application Japan, Jul. 9, 1986, 61-161663; Jul. 9, 1986, 61-161665

Int. Cl.[5] A63B *53/04*

U.S. Cl. 273—167 H **15 Claims**

1. An iron-type golf club head comprising, a main body member having a front side and a rear side, said rear side including a sole portion and a recess, said front side including a wall section having an inner surface in communication with said recess and a shooting surface remote from said inner

surface, said sole portion having an upwardly extending rear rise spaced from said inner surface of said wall section, said rear rise being of a predetermined length, width and weight to facilitate the adjustment of the center of gravity of the golf



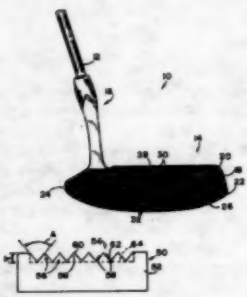
club head, a fiber reinforcement member disposed in said recess adjacent said inner surface of said wall section, and support means for fixing said fiber reinforcement member in said recess.

4,964,641

GOLF CLUB WITH ELECTRICAL DISCHARGE MACHINED FACE

Gary D. Miesch, Gowen; Gregg D. Miesch, Comstock Park, and Donald H. Miesch, Grand Rapids, all of Mich., assignors to Diversified Metal Incorporated, Grand Rapids, Mich.

Filed Jan. 26, 1990, Ser. No. 470,922
Int. Cl.[5] A63B *53/04*
U.S. Cl. 273—175 **20 Claims**



12. A golf club comprising:

a shaft;

a club head secured to said shaft, said club head defining a golf ball striking surface, said surface being substantially flat and having a flatness deviation of less than 0.005 inches, said surface further having a pattern thereon having structural characteristics corresponding to those resulting from machining a surface by an electrical discharge making process which reduces surface contact area, increases the coefficient of friction of the surface, and increases surface hardness.

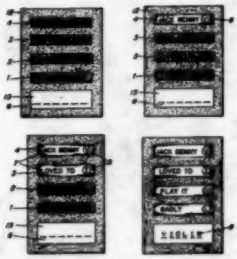
4,964,642

VARIABLY SCORED SKILL GAME

Stuart J. Kamille, Glenbrook, Nev., assignor to Longview Corporation, Reno, Nev.

Filed May 15, 1989, Ser. No. 352,146
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—240 **25 Claims**

1. A game comprising in elicited response having a plurality of portions, a playing surface having at least one playing field comprising a player response area to be marked by a player with a response approximating said elicited response, and multiple clues to said elicited response printed thereon and concealed by removable concealing means: each of said con-



cealed clues comprising at least one word and a portion of said elicited response to aid in determining said elicited response.

4,964,643

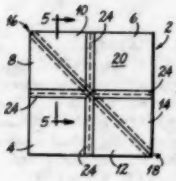
FOLDABLE GAME BOARD AND METHOD OF MAKING THE SAME

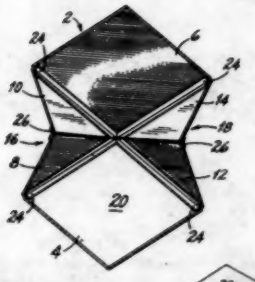
David L. Hass, 5629 W. Keefe Ave., Apt. 4, Milwaukee, Wis. 53216

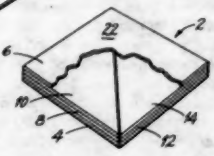
Filed Aug. 3, 1989, Ser. No. 388,861
Int. Cl.[5] A63F *3/00*; A63H *33/16*
U.S. Cl. 273—285 **16 Claims**

14. A foldable square game board having first and second planar surfaces and a thickness no greater than one-eighth the length of a side of said board, at least one of said first and second planar surfaces defining a planar game-playing surface, said board being foldable to a square storage condition having a size one-fourth the original square and four times its thick-

ness, said board being scored on said first surface along two perpendicular lines each bisecting said surface defining a quadrilateral pattern and being scored on said second surface along a diagonal line extending between a pair of opposite corners.







4,964,644

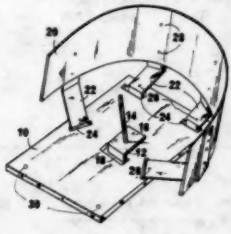
PORTABLE HORSESHOE COURT

Harold L. Hull, 401 Canyon Way, Sp. 43, Sparks, Nev. 89434, and John R. McCutcheon, 44 Main, Taylorsville, Calif. 95983

Filed Nov. 13, 1989, Ser. No. 435,159

Int. Cl.[5] A63B *67/00*

U.S. Cl. 273—336 **7 Claims**



1. A portable horseshoe pit for use in playing the game horseshoes comprising; A first base, said first base being substantially rectangular, a second metal base, means to releasably attach said second base to and above said first base, a metal stake, a backstop, said metal stake being secured at its lower end to said second base, said metal stake to extend above and slant forward at an angle to the vertical when said second base is releasably attached to said first base, means to releasably attach said first base to a surface, and means to releasably attach said backstop to said first base.

4,964,645

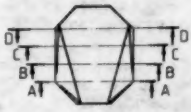
RACKET HANDLE

Genhone Lai, IF, No. 46, Alley 3, Lane 187, Sec. 3, Cheng Kung Rd. Taipei, Taiwan, assignor to Genhone Lai, Taipei City, Taiwan

Filed Jun. 28, 1989, Ser. No. 372,570

Int. Cl.[5] A63B *49/08*

U.S. Cl. 273—73 J **5 Claims**



1. A handle for a racket having a head portion with a generally planar hitting surface, the handle having a first end oriented toward the head portion and a second end oriented away from the head portion and comprising a pair of surfaces formed on the exterior of the handle adjacent to the second end of the handle, one surface located on each side of the plane of the hitting surface, each surface being obliquely oriented with respect to the plane of the hitting surface such that opposite edges of each surface meet to form a vertex pointing generally towards the first end of the handle.

4,964,646

FLUID HANDLING APPARATUS WITH SHAFT SLEEVE AND EXTENSION

Clark S. Boster, Whittier, Calif., assignor to BW/IP International, Inc., Long Beach, Calif.

Filed Mar. 27, 1989, Ser. No. 328,675

Int. Cl.[5] F16K *41/00*; B25G *3/00*; F04O *29/00*

U.S. Cl. 277—5 **14 Claims**

1. In a fluid handling apparatus comprising a fluid machine connected by a drive shaft and a coupling to a motor, and a multistage mechanical seal assembly for progressively reducing the pressure of any leakage of product fluid along said shaft toward said motor, said mechanical seal assembly encircling a seal sleeve which surrounds said shaft and which is rotatable therewith, the improvement comprising:

an extension sleeve between said drive shaft and said coupling;

means providing a positive driving connection between said extension sleeve and said seal sleeve;

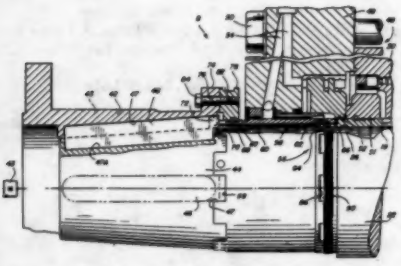
means providing a positive driving connection between said extension sleeve and said coupling;

a drive sleeve between said shaft and said coupling and being encircled by said extension sleeve;

means providing a positive driving connection between said drive sleeve and said seal sleeve;

means providing a positive driving connection between said drive sleeve and said coupling;

said drive sleeve transmitting torsional forces between said



shaft and said coupling and said extension sleeve transmitting axial thrust to said seal sleeve; and

an additional seal assembly encircling said extension sleeve to maintain a substantially constant exit pressure for the last of the stages of said multi-stage mechanical seal assembly

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4,964,647

SHAFT SEALING RING

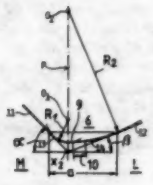
Bernd Stephan, Remscheid-Lennep, Fed. Rep. of Germany, assignor to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Dec. 16, 1988, Ser. No. 285,386

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743843; Feb. 12, 1988, 3804284

Int. Cl.[5] F16J *15/32*

U.S. Cl. 277—153 **7 Claims**



1. In a shaft sealing ring adapted to be coaxially inserted on a shaft for sealing a fluid medium from the environment; including an elastomeric body forming a housing and a sealing lip integral with and projecting generally axially from said housing; said sealing lip having a sealing edge constituted by an annular sealing surface; said shaft sealing ring having a non-installed, relaxed state in which said annular sealing surface has a varying inner diameter as viewed in axial section taken across any radius of the seal; said shaft sealing ring having an installed state in which said shaft sealing ring surrounds a shaft to be sealed and said annular sealing surface is radially deformed to conform to an outer face of the shaft along an axial length portion thereof; said axial length portion defining a running zone of said shaft sealing ring; said running zone having a first end adjoining, in the installed state, the fluid medium and a second end adjoining, in the installed state, the environment to be sealed from the fluid medium; the improvement wherein said annular sealing surface has, in said non-installed state, a first curved portion adjacent said first end having a first radius of curvature as viewed in axial section taken across any radius of the seal, a second curved portion adjacent said second end having a second radius of curvature as viewed in axial section taken across any radius of the seal, and a smallest inner diameter which is located, when viewed in said uninstalled state, along said first curved portion closer to said first end than to said second end; said first radius of curvature and said second radius of curvature respectively having different radii of curvature.

4,964,648

ADAPTOR HANDLE WITH ADJUSTING MECHANISM

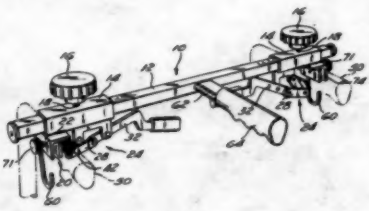
Gerald Berkowitz, 33 Highbury St., Prospect South, Australia

Continuation-in-part of Ser. No. 265,484, Nov. 1, 1988. This application Aug. 16, 1989, Ser. No. 394,641

The portion of the term of this patent subsequent to Oct. 10, 2006, has been disclaimed.

Int. Cl.[5] B62B *3/00*

U.S. Cl. 280—304.5 **7 Claims**



1. An adaptor handle for wheeled vehicles and the like having a pair of rearwardly extending spaced-apart handles for application of propulsion forces and steering comprising:

an elongate arm member sized to extend across the pair of spaced-apart handles of the vehicle;

an over-center latch mounted adjacent opposite ends of said arm member for releasably clamping said arm member to said pair of handles of the vehicle;

a hand grip centrally mounted to said arm member and extending rearwardly therefrom adapted to be grasped in the hand of a user;

a plate member mounted adjacent said opposite ends of said arm member and cooperating with said over-center latch, said plate member including a knurled knob, having a threaded shank, extending through said plate member; and

an adjustable plate rotatably attached to the threaded shank of said knurled knob.

4,964,649

SNOWBOARD BOOT BINDER ATTACHMENTS

Justin M. Chamberlin, Apartment 15G, 713 J Clyde Morris Blvd., Newport News, Va. 23601

Filed Mar. 15, 1989, Ser. No. 323,812

Int. Cl.[5] A63C *9/08*

U.S. Cl. 280—618 **13 Claims**

1. Apparatus responsive to rider action for enhancing the maneuverability of a snowboard comprising:

a pair of first circular plate members adapted to be secured in a fixed spaced relationship directly to a snowboard,

a pair of second plate members rotatably secured, one each, to said pair of first circular plates to thereby permit relative rotation between said first and said second plates,

boot binder means secured to each of said second plates for releasably engaging the boots of a snowboard rider,

each of said pair of second plate members being responsive

to rider induced action to rotate relative to each of said first circular plate members,

at least one elastomer element disposed between each connected first and second plate to limit relative rotation therebetween and to exert a force on said plates to effect return to an original preset position after said plates are rotated relative to each other,

adjustment means attached to the top surface of each of said pair of second plates to permit separate fixed angular adjustment settings for said boot binder means on each member of said pair of second plates,

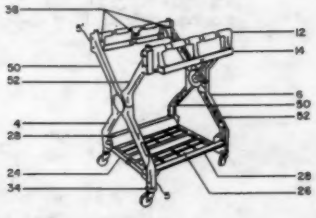
said at least one elastomeric element comprising at least a pair of elongated coil springs, each member of said first pair of plates having an annular channel therein for supporting each member of said pair of coil springs, stop means disposed within said annular channel and abutting an end of each of said pair of elongated coil springs, depending boss means attached to and extending from each member of said second pair of plates and disposed within said channel, said depending boss means abutting an end of each said pair of elongated coil springs opposite to the end thereof abutting said stop means, said depending boss means being rotatable with said second plate member and serving to compress at least one member of said pair of coil springs toward said stop means during rotation thereof.

4,964,650

PLASTIC X-FRAME CART

Thomas Dickinson, St. Louis, Mo., assignor to Contico International Inc., St. Louis, Mo.

Filed Sep. 6, 1988, Ser. No. 240,676
Int. Cl.[5] B62B *3/02*
U.S. Cl. 280—641 **9 Claims**



1. A plastic X-frame cart comprising:

(a) first and second pairs of legs, each pair of legs including two legs pivotally connected together at substantially the mid-portion thereof, wherein end sections of each pair of legs that extend from said mid-portion diverge to an open operative position and converge to a folded position;

(b) a rotator element formed with each leg at the mid-portion thereof, the rotator element of each leg of each pair of legs being pivotally connected together, wherein a center line in all planes extending through the end sections and rotator element of each leg is a straight line, each said pair of legs being symmetrical about a vertical line passing through said rotator elements between the legs of said pair of legs;

(c) at least one support member connecting an upper end of at least one leg of said first pair of legs to an upper end of at least one leg of said second pair of legs; and

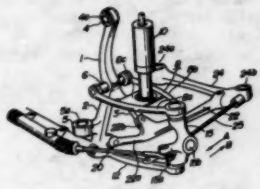
(d) said end sections of each pair of legs include a portion that extends in a substantially vertical orientation when the cart is in the open operative position.

4,964,651

SUSPENSION FOR MOTOR VEHICLES

Kanji Kubo, Tochigi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1989, Ser. No. 351,965
Claims priority, application Japan, May 16, 1988, 63-118497
Int. Cl.[5] B06G *3/18*
U.S. Cl. 280—690 **7 Claims**



1. A suspension for a motor vehicle having a vehicle body and a road wheel, comprising in combination:

a movable support member having upper and lower ends adapted to be movably attached to the vehicle body;

a knuckle having upper and lower ends adapted to support the road wheel;

an upper arm having one end pivotally coupled to said support member and an opposite end coupled to said upper end of said knuckle; and

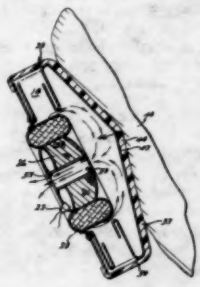
a lower arm having one end pivotally coupled to said lower end of said support member and an opposite end coupled to said lower end of the knuckle.

4,964,652

INFLATABLE RESTRAINT

James P. Karlow, Milford, Mich., assignor to Automotive Systems Laboratory, Inc., Farmington Hills, Mich.

Filed Jun. 26, 1989, Ser. No. 371,327
Int. Cl.[5] B60R *21/28*
U.S. Cl. 280—731 **1 Claim**



1. An inflatable restraint for the occupant of a motor vehicle comprising

an airbag module having a frangible cover member,

an inflatable airbag disposed internally of said module and adapted to rupture the cover member thereof upon inflation of said airbag,

a gas generator communicating with the interior of said airbag,

a pressure relief channel communicating with the interior of said airbag and with the ambient environment externally of said module, and

a rupturable diaphragm in said pressure relief channel normally positively separating the interior of said airbag from the ambient environment, said diaphragm being ruptur-

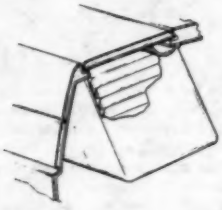
able upon the occurrence of a predetermined threshold pressure in said airbag prior to full deployment thereof thereby to instantaneously relieve pressure in said airbag to preclude excessive deployment impact on said vehicle occupant.

4,964,653

SELF-SKINNED FOAM COMPONENT FOR AN INFLATABLE RESTRAINT DOOR ASSEMBLY

Kent L. Parker, Barrington, N.H., assignor to Davidson Textron Inc., Dover, N.H.

Filed Aug. 24, 1989, Ser. No. 398,252
Int. Cl.[5] B60R *21/16*
U.S. Cl. 280—732 **10 Claims**



1. A door assembly for an opening through which an inflatable restraint safety device may be deployed, said assembly comprising;

a frame for supporting an inflatable restraint safety device and an opening presented in said frame;

a door disposed in said opening and capable of rapidly moving so that said inflatable restraint device may be deployed through said opening;

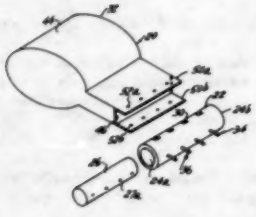
said assembly characterized by said door including an impact plate portion and a foam portion bonded to said impact plate portion with said foam portion including a microcellular component having a first predetermined density and an integral outer skin component distinct from said microcellular component and formed integral with said microcellular component and having a second predetermined density which is greater than said first predetermined density of said microcellular component for providing an aesthetically pleasing non-separable surface on said microcellular component.

4,964,654

AIR BAG ASSEMBLY

Robert J. Bishop, Washington; Robert P. Fontecchio, Rochester Hills, and Daniel G. Zelenak, Jr., Rochester, all of Mich., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed May 11, 1989, Ser. No. 350,431
Int. Cl.[5] B60R *21/16*
U.S. Cl. 280—743 **32 Claims**



1. An assembly comprising:

a hollow cylindrical member or can including an opening into which generator means may be inserted, the generator means of the type responsive to a control signal, for generating gas to inflate an air bag means;

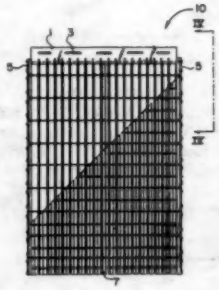
air bag means, responsive to the gas, for protecting, when activated, an occupant of a vehicle, comprising an inflatable bag or sack, a portion thereof being disposed in a compacted or stored condition, during periods prior to deployment, proximate a side of the cylindrical member containing at least one aperture, the inflatable bag, including an open end, generally opposite the compacted portion, disposed about the cylindrical member to receive the gas and including relatively opposing flaps extending from proximate the open end and adapted to envelop a portion of the cylindrical member, the flaps, proximate a side of the cylindrical member, away from the at least one aperture, disposed in an overlapping, condition, one to the other.

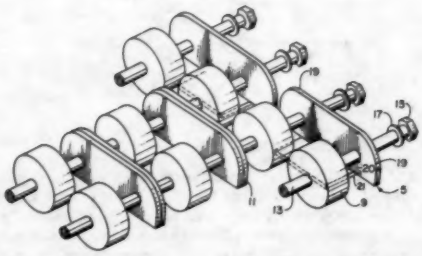
4,964,655

HEAVY DUTY MUD FLAP

Larry C. Tucker, 5145 Dewitt St., Bay City, Mich. 48706

Filed Dec. 13, 1989, Ser. No. 449,755
Int. Cl.[5] B62D *25/16*
U.S. Cl. 280—851 **10 Claims**





1. An improved mud flap for reducing spray from vehicle tires comprising:

a) a plurality of mud flap segments, each mud flap segment further comprising:

(i) a pair of retaining rods;

(ii) at least a pair of laterally spaced metal segments, each metal segment having a first leg and a second leg, each said first leg having a pair of aligned openings therein and a first edge having a pair of opposed curved corners; each said second leg being attached to said first leg at a second edge of said first leg, said second edge being opposite said first edge, each respective said pair of metal segments being mounted on each respective said retaining rod;

(iii) a plurality of laterally spaced rubber segments, each said rubber segment being mounted on each respective said retaining rod and being situated between each said pair of laterally spaced metal segments;

(iv) a plurality of spacers, each said spacer having at least one opening therein for mounting said spacer on a respective said retaining rod, each respective said spacer being situated between said laterally spaced rubber segments;

(b) wherein said mud flap segments are vertically connected together to form said mud flap.

4,964,656

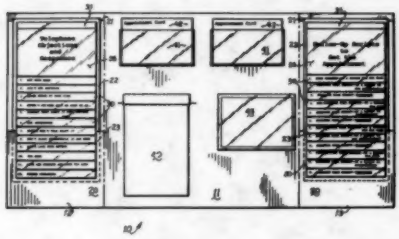
TELEPHONE MARKETING DEVICE

John W. Prentice, Batesville, Ind., assignor to Forethought Life Insurance Company, Batesville, Ind.

Filed Apr. 18, 1988, Ser. No. 182,383

Int. Cl.[5] B42D *1/00, 5/00*; G09F *19/00*

U.S. Cl. 281—44 **4 Claims**



1. A telephone marketing device for guiding a salesman through a variety of situations in dealing with a prospect comprising,

a panel,

a plurality of transparent pockets mounted on said panel in vertically shingled relation, with upper pockets lying over lower pockets, each pocket presenting an exposed strip at its lower edge,

a card in each pocket,

each card having at its lower edge a title that defines a situation, such as a telephone objection or a situation concerning the setting of an appointment, the title being positioned within said strip so as to be exposed, all titles being visible when said shingled pockets lie flat on said panel,

each card having, above said title, printed subject matter that specifically guides the salesman in dealing with the situation defined in said title, said guiding subject matter being exposed only when an overlying pocket is raised.

4,964,657

WATER FACET INLET LINE CONNECTOR

Teodoro J. Gonzales, Canyon Country, Calif., assignor to Price Pfister, Inc., Pacoima, Calif.

Filed May 3, 1989, Ser. No. 347,106

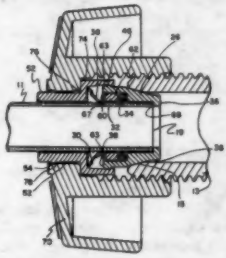
Int. Cl.[5] F16L *21/02*

U.S. Cl. 285—8 **21 Claims**

1. An inlet water line connector for connecting an inlet water line having a predetermined outer diameter to the end of a water faucet shank having external threads on the outer cylindrical surface and a tapered internal inlet region larger in diameter than said predetermined outer diameter of the inlet water line, comprising:

a body having first and second ends and an opening therethrough into which first end an inlet water line of the predetermined outer diameter may be inserted, said body having an outer tapered surface for fitting within and engaging the tapered internal inlet region of the faucet shank, said body also having a shoulder in the form of an outward directed flange formed on said body between said outer tapered surface and said first end thereof against which pressure may be applied to force said shank with said outer tapered surface thereof having a forced fit with the tapered internal inlet region of the faucet shank;

a unitary spring member within said body having a plurality of integral spring elements projecting inward and angled toward said second end of said body, said spring elements in a free state collectively defining an inner periphery thereof of a diameter greater than the predetermined outer diameter of the inlet water line, said spring elements being elastically deflectable but remaining in a free state as the inlet water line is inserted through said body;



a first member within said body and normally positioned between the spring elements and the second end in spaced relation to said spring elements; and

force generating means cooperable with said outward directed flange of said body for compressing the body into the internal inlet region of said faucet shank to develop compressive forces which are transferred to said first member, with the forced fit between the outer tapered surface of the body and tapered internal region of the faucet shank limiting axial movement of the body toward the faucet shank, which said first member transferring the compressive forces developed between the body and force generating means through the spring elements for deflecting the spring elements into forcible engagement with the outer surface of said inlet water line.

4,964,658

SMALL-SIZE PIPING COUPLING JOINT

Masayoshi Usui, Numazu; Katsushi Washiza, Shizuoka, and Kazunori Takikawa, Numazu, all of Japan, assignors to Usui Kokusai Sangyo Kaisha Ltd., Shizuoka, Japan

Filed Jul. 28, 1989, Ser. No. 387,491

Claims priority, application Japan, Jul. 29, 1988, 63-100870[U]; Jul. 29, 1988, 63-100869[U]; Aug. 12, 1988, 63-106798[U]

Int. Cl.[5] F16L *39/00*

U.S. Cl. 285—319 **7 Claims**

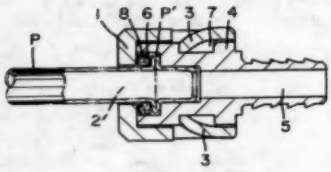
1. A small-size pipe coupling joint comprising:

a cylindrical retainer member having an opened coupling end, an opposed bottom wall and a circumferential wall extending therebetween, the bottom wall having a pipe insertion hole passing centrally therethrough, the opened coupling end defining a socket receiving recess extending to the bottom wall, the circumferential wall being circumferentially continuous adjacent the coupling end of the retainer member but comprising at least one locking claw wall intermediate the ends and projecting slantingly into the socket receiving recess and toward the bottom wall;

a socket member having a rear end, a forward end and a flow hole extending therebetween, portions of said flow hole adjacent the forward end defining a stepped expanded

chamber, the forward end being disposed in the socket receiving recess of the retainer member and adjacent the bottom wall thereof, an outer circumferential portion of said socket member being characterized by an engaging groove disposed in the socket receiving recess and being lockingly engaged by the claw wall for securely retaining the socket member in the socket receiving recess of the retainer member;

a pipe having a coupling end and an annular swelling wall, the pipe passing through the pipe insertion hole of the retainer member such that the annular swelling wall and



the coupling end thereof are engaged intermediate the bottom wall of the retained member and the expanded chamber of the socket member; and

seal means provided in the expanded chamber of the socket member and adjacent the annular swelling wall of the pipe, whereby the continuous circumferential wall portion of the retainer member adjacent the coupling end thereof prevents accumulation of foreign matter at the engagement of the claw wall with the opening groove of the socket member for ensuring secure retention of the pipe, the retainer member and the socket member in locked engagement with one another.

4,964,659

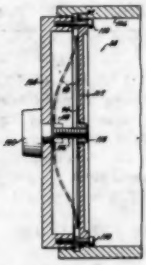
DIAPHRAGM LATCH MECHANISM

William C. Baldwin, 14 Elfin, Irvine, Calif. 92714

Continuation of Ser. No. 141,971, Jan. 11, 1988, abandoned. This application Dec. 11, 1989, Ser. No. 450,215

Int. Cl.[5] E05C *9/00*

U.S. Cl. 292—19 **2 Claims**



1. A latching mechanism comprising:

a flat planar resilient member having a perimeter lip, said member being split along a plurality of radial lines, said radial lines each terminating at respective points located about the center of said member and extending through said permitter lip, the continuity of said lip being interrupted only by splits lying on said radial lines;

frame means having a continuous slot therein for receiving the entirety of said lip, and

means for increasing and reducing the perimeter of said resilient member defined by said lip to uniformly extend from a position of disengagement with said continuous slot into a position of engagement therewith and to withdraw from said engagement through application of a force component substantially perpendicular to the plane of said planar resilient member resulting in a lateral insertion force.

4,964,660

LOCKING DEVICE INCLUDING LOCKING, POSITIONING, AND SEALING MECHANISMS

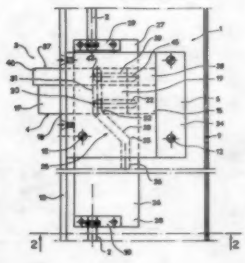
M. Gérard Prevot, Willerwald; M. Laurent Aumercier, Phalsbourg, and M. Philippe Simoncelli, Hoff, all of France, assignors to Ferco International Usine de Ferrures de Batiment, Sarrebourg, France

Filed Jun. 9, 1989, Ser. No. 363,685

Claims priority, application France, Jun. 20, 1988, 88 08418

Int. Cl.[5] E05C *1/06*

U.S. Cl. 292—37 **11 Claims**



1. A locking device for locking a movable member with respect to a frame member, said locking device comprising in combination a dead bolt adapted to be supported by the movable member for movement between an extended position and a retracted position with respect to the movable member, means for moving said dead bolt between said positions, said extended position comprising engaging said dead bolt with a correspondingly positioned aperture in the frame member, means for positioning the movable member with respect to the frame member, said means for positioning adapted to be supported for movement by the movable member between extended and retracted positions with respect to the frame member, means for moving said positioning means between said positions, said extended position engaging said means for positioning with a correspondingly positioned aperture in the frame member, and means for sequentially actuating said dead bolt and said means for positioning for movement between said extended and retracted positions.

4,964,661

TWO-PART CASING LATCHING MECHANISM

Peter F. Cadwell, Sunnyvale, and Noah L. Anglin, San Jose, both of Calif., assignors to Poget Computer Corporation, Sunnyvale, Calif.

Filed Jun. 30, 1989, Ser. No. 373,768

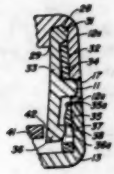
Int. Cl.[5] E05C *3/04*

U.S. Cl. 292—87 **8 Claims**

1. A latching mechanism for a molded plastic hinged container for a computer having an upper casing and a lower casing, each of said upper casing and said lower casing having a peripheral sidewall of a predetermined of the order of 1 to 2 mm. in thickness for maximizing an interior volume of said container for reception of computer operating components;

means for forming a recess in an inner peripheral surface of one of said sidewalls and a latch keeper extending parallel to said one sidewall and forming a wall bounding said recess;

an elongated molded plastic latch pivotably extending from an inner periphery of the remaining peripheral sidewall, said latch having a cantilevered end in latching abutment with said latch keeper when said upper casing and bottom casing are in container "closed" condition; and



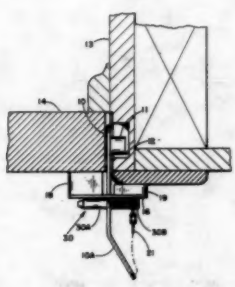
push button means integrally with and extending outwardly from said latch through an aperture in one of said sidewalls and being operable for pivoting said latch to release the latching abutment of said latch cantilevered end and said latch keeper and to allow opening of said container.

4,964,662

PORTABLE DOOR SECURING DEVICE

Timothy J. O'Leary, 853 Stryker Ave., St. Paul, Minn. 55107, and Roger R. Brown, 8755 Hamlet Ave. S., Cottage Grove, Minn. 55016

Filed Mar. 26, 1990, Ser. No. 498,414
Int. Cl.[5] E05C *19/18*
U.S. Cl. 292—295 **3 Claims**



1. In a portable securing device for a door which is hingedly mounted in an opening which has a door jamb with a striker plate having an opening in the door jamb for receiving a latch, there being a space between the side edge of the door and the door jamb when the door is closed, said device having a rigid strip member resting in the space between the door and the door jamb, a rigid stud extending out from one surface of the strip member near one end for engaging the striker plate opening with the strip member extending beyond the inner plane of the door and the door jamb when the door is closed and having a plurality of equally dimensioned staggered holes, and a rigid locking plate member having a centered slot for engaging the strip member so that the locking plate member is slideably movable along the extended portion of the strip member with the locking plate extending over the door jamb and the door when the door is closed, the improvement comprising:

a slightly compressible pad member on the locking plate facing the door;

a highly compressible pad member on the locking plate facing the door jamb; and

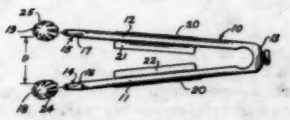
a locking pin engageable with one of the staggered holes in the strip for making pressing engagement against the locking plate when the locking plate is pressed firmly against the door, one-half of the length of the locking pin dimensioned to snugly but slidingly engage the hole the remaining half-length of the pin being roughened to prevent sliding engagement in the hole and to make biting frictional contact with the interior of the hole in the strip member.

4,964,663

DEVICE FOR HANDLING A PLASTIC CONTACT LENS

Arthur C. Jermyn, 15914 Overview Rd., Poway, Calif. 92064

Filed Oct. 23, 1989, Ser. No. 425,487
Int. Cl.[5] A47F *9/00*
U.S. Cl. 294—1.2 **3 Claims**



1. A device for engaging and removing a plastic contact lens in position relative to the eye of a user, comprising:

a first arm and a second arm having facing surfaces and arranged at an acute angle relative to each other, the arms being integrally joined at one end and formed of a hard, resilient polypropolyene material to establish a first position of maximum separation of the free ends of the arms and being movable, one toward the other and in the same plane, from the first position into a second position of minimum separation of the free ends of the arms;

an extension integral and coextensive with the free end of each of the arms and inclined at an angle of 40–50 degrees relative to its respective arm and the plane of movement of the arms;

means integral with the facing surface of each arm for abutting one another to limit the movement of the arms in the plane of movement to establish the second position of the arms; and

a member of generally ellipsoidal shape having a central aperture for receiving a respective extension for mounting one of the same on each arm, each member being provided with a plurality of peripheral, axial grooves with the edge of a corresponding groove on each member releasably engaging the contact lens within the peripheral edge thereof when the arms are in the first position, and slightly folding the contact lens as the arms are moved into the second position, thereby releasing the contact lens from the eye and retaining the same between the members as the device is moved in a direction away from the eye.

4,964,664

MULTIPLE LEVER SIDE POLE WRENCH

John P. Crittenden, South Cross Rd., Staatsburg, N.Y. 12580

Filed Jul. 11, 1989, Ser. No. 378,700
Int. Cl.[5] B66C *1/00*; E04H *15/32*
U.S. Cl. 294—15 **10 Claims**

1. A non-slip wrench for erecting a tent pole having at least one erecting opening therein, comprising:

(a) handle means;

(b) pole engaging means;

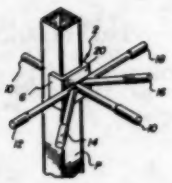
(c) said pole engaging means including a pole engaging surface;

(d) said handle means including an elongated central bar extending through said pole engaging means and being rigidly connected thereto;

(e) said central bar of said handle means extending through said pole engaging surface a substantial distance for full

insertion into the tent pole opening until said pole engaging surface contacts the tent pole;

(f) said pole engaging means includes anti-torque means connected thereto for preventing twisting of the wrench relative to the tent pole when the pole is being erected;



(g) said handle means includes at least one lever extending from said pole engaging means; and

(h) said at least one lever is attached to said central bar at a location where said central bar engages said back surface.

4,964,665

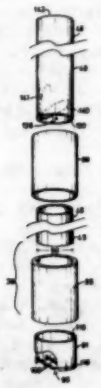
PECAN NUT COLLECTOR

John Q. Crow, 1609 W. 8th St., Texarkana, Tex. 75501

Filed Jun. 27, 1989, Ser. No. 372,018

Int. Cl.[5] A01D *46/00*

U.S. Cl. 294—19.2 3 Claims



1. A hand-held nut collector constructed of lightweight, weather-resistant PVC tubing for permitting a harvester to gather nuts from the ground while maintaining a generally upright posture, said collector comprising:

an elongated tubular housing comprising an input tube, a storage tube, and a first sleeve for axially removably coupling said input and storage tubes together, said input and storage tubes having substantially equal inner diameters and substantially equal outer diameters;

a tubular insert at the bottom of said housing defining a mouth for capturing said nuts;

a second sleeve for axially coupling said tubular insert to said housing at the bottom of said input tube, said second sleeve comprising an interiorly defined sleeve shoulder, wherein said input tube and said tubular insert are maintained in spaced apart relation within said sleeve by said sleeve shoulder;

a plurality of parallel, spaced-apart springs resiliently extending across and normally blocking said mouth for flexibly bending upon contact with nuts to admit them into said collector, the springs defining nut-admission paths expandable from one-half to one and one-fourth inches wide;

said insert having an outer diameter substantially equal to the outer diameter of said input tube to facilitate mutual coupling by said second sleeve, but having an inner diameter smaller than the inner diameter of said input tube, whereby an annular shoulder is formed within said mouth to temporarily restrain nested nuts above said sleeve shoulder and to minimize downward pressure of captivated nuts upon said springs;

a gate for allowing one-way passage of objects from said input tube into said storage tube, said gate comprising a rigid plate pivotally anchored within said housing, wherein the length of said gate is greater than the inner diameter of said housing; and,

a removable end cap for normally closing said storage tube for preventing inadvertent release of objects, said cap permanently linked by a flexible cord to said storage tube to prevent inadvertent separation.

4,964,666

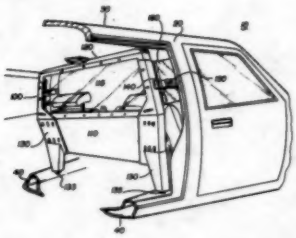
MOUNTING SYSTEM FOR SECURITY SHIELD IN POLICE VEHICLES

John A. Dillon, Ypsilanti, Mich., assignor to Automotive Prototypes & Equipment, Ann Arbor, Mich.

Filed Nov. 2, 1988, Ser. No. 266,125

Int. Cl.[5] B62D *33/04*

U.S. Cl. 296—24.1 20 Claims



1. A security shield for vehicles having lateral frame members disposed beneath the floor on either side of the vehicle, comprising:

a shield body constructed to extend for substantially the entire width of the vehicle from the roof to a position below the backrest of the front seat preventing access from the rear seat to the front seat; and

a pair of legs, one of said legs mounted on either side of said shield body, each leg having a foot constructed to be disposed over a corresponding lateral frame member of the vehicle and an adjustment screw disposed in said foot, said adjustment screw rotatable for extension from the corresponding leg to raise said shield body from the corresponding lateral frame member toward the roof of the vehicle;

each of said pair of legs mounted on said shield body in an overlapping fashion having an overlap extent selectable during installation to control the lateral dimension of said security shield;

said foot of each of said pair of legs includes a tapped hole for accommodation of said corresponding adjustment screw; and

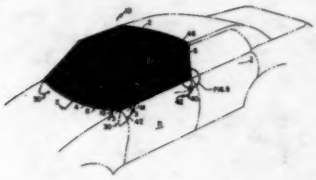
each of said adjustment screws includes a substantially conical end adapted for high friction contact with the floor of the vehicle and a means for facilitating rotation.

4,964,667

PROTECTIVE COVER FOR A VEHICLE

Farrell L. Reis, 11881 Kirkwood Rd., Herald, Calif. 95638, and Gayle A. Helms, 1522 Q St., Riolinda, Calif. 95673

Filed Oct. 24, 1988, Ser. No. 261,261
Int. Cl.[5] B60J 11/00
U.S. Cl. 296—95.1 19 Claims



1. A window cover kit for vehicles comprising in combination:

cover means including a front panel and a pair of side panels of a mesh material for covering side windows and a windshield of the vehicle that precludes heat and sight therebeyond, a plurality of tethers depending from said cover means and strategically placed adjacent vehicle portals, said tethers including a central core formed from not easily frangible material,

said core and tethers fastened to said cover means,

whereby said kit protects the windows and interior of the vehicle from both visual and thermal intrusion,

wherein said central core is formed from wire material,

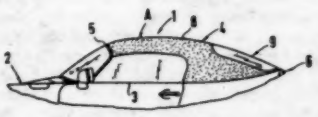
and wherein said tethers depend from said cover means along the intersection of a leading edge of said side window and a side edge of said windshield by means of a dart formed from said mesh material of leading edges of said side panels and lapped over free side edges of said mesh material of said front panel, stitching and coupling said edges together, and an upper and a lower reinforcing strip sewn and overlying said dart, said wire interposed between said reinforcement strip and said dart.

4,964,668

TOP FOR VEHICLES, PARTICULARLY PASSENGER CARS

Franz Hofmann, Hausen/Würm, Fed. Rep. of Germany, assignor to Dr. Ing.h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Aug. 30, 1989, Ser. No. 400,718
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1988, 3829345
Int. Cl.[5] B60J 7/08
U.S. Cl. 296—107 17 Claims



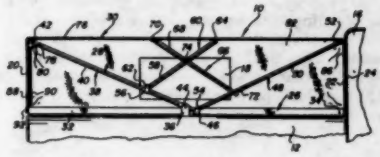
1. A top for a vehicle, particularly a passenger car, comprising an exterior top covering and a top linkage hinged to a body of the vehicle and having several bows extending transversely with respect to a longitudinal direction of the vehicle, wherein on a side of the exterior top covering which faces a passenger space, a noise/thermal insulating intermediate layer having top and bottom supporting layers, and an interior ceiling are arranged and wherein the exterior top covering, supporting layers of the noise/thermal insulating intermediate layer and the interior ceiling are fastened to a plurality of the several transversely extending bows.

4,964,669

FOLDABLE TOP FOR TRUCK BED

William F. Geier, Rt. 1, Box 742, White Stone, Va. 22578

Filed Nov. 13, 1989, Ser. No. 435,983
Int. Cl.[5] B60J 7/12
U.S. Cl. 296—108 19 Claims



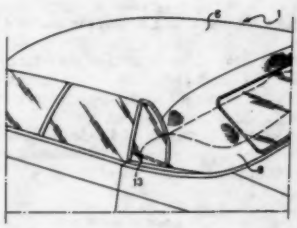
1. A folding support frame for a flexible cover for a truck bed, said support frame including a pair of transversely aligned upstanding first hinges, a first generally U-shaped frame member including two legs joined together at first ends by a first cross bar and pivotally connected to said first hinges adjacent second ends, second hinges carried by said first frame member generally at said second ends second frame member having first ends joined by a second cross bar and second ends pivotally connected to said second hinges, and link means extending between legs of said first and second frame members for effecting simultaneous hinging of said frame members means for attaching said first hinges to a truck bed.

4,964,670

FLEXIBLE HOOD FOR A CONVERTIBLE MOTOR VEHICLE, PROVIDED WITH ELEMENTS FOR COVERING RECESSES IN THE LID OF THE COMPARTMENT INTO WHICH THE HOOD IS FOLDED

Enrico Dogliani, Pecetto, Italy, assignor to Industrie Pinifarina S.p.A., Turin, Italy

Filed Jul. 25, 1989, Ser. No. 384,969
Claims priority, application Italy, Jul. 25, 1988, 53324/88[U]
Int. Cl.[5] B60J 7/20
U.S. Cl. 296—136 7 Claims



1. A flexible hood (1) for a convertible motor vehicle, which is movable between an extended position in which it covers the passenger compartment of the motor vehicle and a folded, non-covering position in which it is housed in a compartment (9) of the motor vehicle, the flexible hood comprising:

a pivoted framework (2) including a rear arch (3) articulated at its ends (4) to the motor-vehicle body (5),

a flexible fabric cover (6) which is associated with the framework (2) and connected at its rear edge (7) to the arch (3), the compartment (9) having a rigid lid (8) for closing it both when the hood (1) is folded in the compartment (9) and when the hood (1) is extended and the compartment (9) is empty, the rigid lid (8) being articulated at its rear edge (10) to the motor-vehicle body (5) and having recesses (12) at each end of its front edge (11) for avoiding

interference between the lid (8) and the end portions (4) of the rear arch (3) when the latter is pivoted to fold or unfold the hood (1) while the lid (8) is closed,

the hood (1) being characterised in that for each respective recess of the recesses it includes an element (13) for covering the respective recess (12) in the rigid lid (8) when the lid is closed, the covering element (13) having one edge connected to the lid proximate the respective recess and having an opposite edge connected to a means for moving the covering element between an extended position in which it covers the respective recess (12) and which it assumes when the hood (1) is folded in the compartment (9) and a folded position in which the respective recess (12) is at least partly uncovered and which it assumes when the hood is extended.

4,964,671

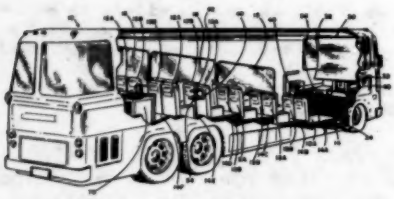
INTERIOR BUS CONFIGURATION

Russell Millar, 824 Demet Dr., Las Vegas, Nev. 89119

Filed Jul. 10, 1989, Ser. No. 377,889

Int. Cl.[5] B60N *3/00*

U.S. Cl. 296—178 **13 Claims**



1. An interior bus configuration comprising:

(a) a driver compartment at the front end of the bus,

(b) a passenger area toward the rear of the bus behind the driver compartment, each seat facing toward the front of the bus,

(c) the passenger area having a plurality of rows of seats,

(d) each row of seats mounted on a step on the interior floor of the bus,

(e) each step becoming progressively higher from the front of the bus toward the back so that the plurality of rows of seats are tiered,

(f) an entertainment station located on the interior of the bus immediately behind the driver compartment and at the front of the passenger area, the entertainment station including a video display screen, and

(g) a series of windows along each side of the bus, the windows being tiered to generally follow the tiering of the seats from the front of the bus to the back.

4,964,672

DASHBOARD SUPPORT CONSTRUCTION FOR COWL REGION OF A MOTOR CAR

Yoshio Fujii, Higashi-Hiroshima, Japan, assignor to Mazda Motor Corp., Japan

Filed Jul. 28, 1989, Ser. No. 386,927

Claims priority, application Japan, Jul. 28, 1988, 63-188879

Int. Cl.[5] B62D *25/08*

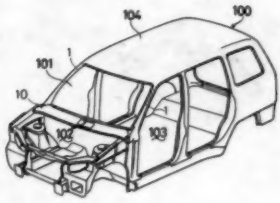
U.S. Cl. 296—192 **7 Claims**

1. A cowl region construction of an automobile comprising:

a roof pillar comprising a roof pillar inner member and a roof pillar outer member, said inner and outer members being joined to form a closed sectional construction extending in a vertical direction;

a dashboard support member having an upper surfaces, a lower surface and a connecting perpendicular surface, the side edge of said dashboard support member being connected to said roof pillar along the vertical interior surface of said roof pillar, said dashboard support member further comprising an opening;

an upper dash panel connected to said dashboard support along the longitudinal edges of said upper and lower surfaces of said dashboard support and to said roof pillar; and



a cowl panel connected to said upper dash panel along the upper longitudinal edge of said upper dash panel and to said roof pillar; wherein said opening of said dashboard support member enables said roof pillar, said cowl panel and said upper dash panel to be simultaneously spot welded together at one or more points through said opening.

4,964,673

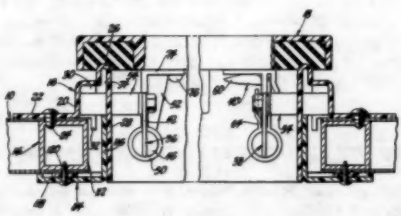
VEHICLE HATCH MOUNTING ASSEMBLY

Ronald C. Lamparter, Grosse Pointe Shores, Mich., assignor to Transpec, Inc., Troy, Mich.

Filed Dec. 19, 1989, Ser. No. 452,352

Int. Cl.[5] B60J *7/08*

U.S. Cl. 296—216 **9 Claims**



1. In an assembly of the type for mounting an outwardly opening hatch (18) in a passenger vehicle opening (12), said assembly including a mounting ring (16), said ring having an integral continuous upstanding portion having an upper edge (26) which forms a hatch sealing edge, said ring having an integral mounting flange portion (22) extending laterally outwardly and overlaying the outside marginal edge of the hatch opening, and a plurality of over-center hinge linkage devices (36 and 38) respectively connected both to the hatch and the mounting ring to permit the hatch to be opened and closed relative to the vehicle hatch opening, each hinge device (36 and 38) including a first member (52) fixed to the interior of the hatch, a plurality of hinge supporting elements (54) projecting laterally inwardly from said mounting ring, each hinge linkage device including lever members (42 and 44) pivotally connected to various of the hinge supporting elements to enable the hatch to be raised above the opening, one hinge linkage device (38) including a latch mechanism (40) adapted to disconnect its associated first member from the mounting ring to enable the hatch to swing open relative to the mounting ring (16) and the vehicle hatch opening (12), a downwardly opening bezel receiving pocket (34) formed in said mounting ring, and a trim bezel (114) of a generally L-shaped configuration

having a rim (116) adapted to project within the bezel pocket and a second laterally extending flange (118) adapted to trim the hatch opening, the improvement comprising:

said mounting ring (16) being a molded plastic member having

a. a first thin wall inner rim (28) depending downwardly from said sealing edge,

b. a second thin wall outer rim (20) spaced laterally outward of the first rim and terminating in the laterally outwardly extending flange (22),

c. said inner rim (28) projecting downwardly below flange (22) of the outer rim and substantially enclosing the hatch opening periphery,

d. the inner and outer rims (20 and 28) defining the bezel receiving pocket (34),

e. the hinge supporting elements (54) projecting inwardly beyond the inner rim (28) whereby when the hatch swings open about at least one of said hinge devices (36) the inner rim can elastically deform laterally inwardly to absorb the hatch opening force and protect the hinge device against damage.

4,964,674

HEATED SEAT

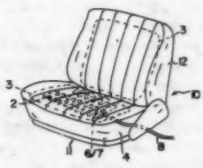
Dieter Altmann, Grundau-Lieblos; Eberhard Haupt, Grundau-Rothenbergen, and Manfred Knüppel, Cologne, all of Fed. Rep. of Germany, assignors to I.G. Bauerhin GmbH, Grundau-Rothenbergen, Fed. Rep. of Germany

Filed Mar. 7, 1989, Ser. No. 320,117

Claims priority, application European Pat. Off., Mar. 8, 1988, 88102949.0

Int. Cl.[5] A47L 7/72

U.S. Cl. 297—180 **13 Claims**



1. A heated seat, comprising:

a molded body having an inner and an outer surface,

cushioning material located along the inner surface of said molded body,

a covering fabric on top of said cushioning material away from said molded body,

a covering foil located between said covering fabric and said cushioning material,

an electrical heating element substantially located between said covering fabric and said covering foil,

a structural block made from pliant material beneath said covering foil and extending into said cushioning material, said structural block including a top oriented toward said covering fabric, a base oriented toward said cushioning material, and a side wall,

a connection plate attached to the base of said structural block thereby being spaced at a distance from said covering fabric and said covering foil,

a portion of said electrical heating element extending to said connection plate, and

connection cable means electrically connected to said portion of said electrical heating element for delivering electric current to said electrical heating element, said connection cable means being mounted on said connection plate at a distance from said covering fabric and said covering foil.

4,964,675

METHOD OF ELECTRO-HYDRAULIC CONTROL OF LONGWALL MINE UNITS

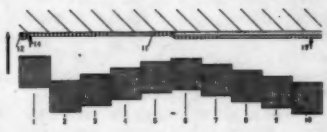
Josef Welzel, Wuppertal, Fed. Rep. of Germany, assignor to Herman Hemscheidt Maschinenfrabrik GmbH & Co., Wuperal, Fed. Rep. of Germany

Filed Aug. 11, 1989, Ser. No. 392,551

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1988, 3827559

Int. Cl.[5] E21D 23/12

U.S. Cl. 299—1 **4 Claims**



1. A method of electro-hydraulic control of a cutting unit incorporating a cutter and self-advancing mine-roof support units in an automated longwall mine, the cutter being guided on a conveyor moved parallel to the working face and extraction being carried out in long cuts extending over substantially the entire length of the longwall with the self-advancing support units and pushing rams forming parts thereof being connected to the conveyor and being advanced in groups depending on the measured length to which the pushing rams are extended, which method includes the steps of:

(a) triggering the extension of the pushing rams for pushing the conveyor from a preset position of the cutter after each extraction cut, the pushing rams being extended to lengths adapted to the depths to which the cutter has cut;

(b) generating a control signal for the sequence of the advance process in one self-advancing support group as soon as the pushing rams have advanced to a preset length as determined by the cutting depth of the cutter and by the number of extraction cuts that have been made; and

(c) moving the self-advancing support groups forward individually and in alternating succession from the two ends of the longwall to the middle thereof.

4,964,676

BRAKE UNIT

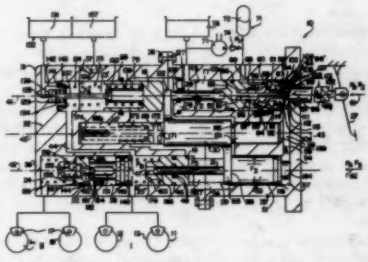
Reinhard Resch, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 27, 1989, Ser. No. 371,843

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1988, 3821730

Int. Cl.[5] B60T 8/26, 8/32, 13/12, 8/44

U.S. Cl. 303—52 **20 Claims**



1. A brake unit for a road vehicle with a hydraulic dual-circuit braking system comprising:

a static front-axle brake circuit and a static rear-axle brake circuit which are respectively connected to a primary

outlet-pressure space and a secondary outlet-pressure space of the brake unit;

brake pressure means for building up and setting a brake pressure value correlated with a brake actuating force applied by a brake pedal activated by the vehicle driver in said primary and secondary outlet pressure spaces including a hydraulic brake booster means comprising a brake valve means generating an outlet pressure which is proportional to a brake pedal force applied by the driver and which is fed into at least one drive pressure space, limited in an axially movable manner by a drive piston of the brake booster;

said outlet pressure causing displacement of the drive piston;

at least one axial-force transmission means displaced by displacement of the drive piston for moving a primary-piston means;

said primary piston means forming a movable side of the primary outlet-pressure space;

a second piston means delimiting the secondary outlet-pressure space, located in said primary outlet space, and movable as a result of the pressure build-up in the primary outlet pressure space;

a housing possessing two housing bores parallel to one another;

the secondary piston means movably delimiting the secondary outlet-pressure space and being displaceably arranged in a pressure-tight manner in one of said housing bores;

at least one piston element mean of the primary-piston means being displaceably guided in a pressure tight manner in the other of said two housing bores;

an effective cross-sectional surface of the said piston element means determining a corresponding part cross-section of the primary outlet-pressure space;

said primary-piston mean comprising a second piston element which, in the event of a failure of said brake booster, remains in a basic position corresponding to a non-actuated state of the brake unit and which is motionally coupled to the brake pedal positively and non-positively;

wherein, in the event of a failure of the front-axle brake circuit, said piston element means, which is supported axially on the second piston element means, can as a result of its axial displacement build-up brake pressure in the secondary outlet-pressure space, and wherein:

the primary outlet-pressure space comprises a first part space which is limited movably on one side by a first piston element of the primary-piston arrangement and otherwise fixedly relative to the housing in the first axial bore of the housing;

a second part space which is in constantly communicating connection with the first part space and which is axially delimited on two sides within the second housing bore by the secondary piston means and two piston elements means of the primary-piston means which are displaceable relative to one another in a pressure-tight manner;

one of said piston element means is designed as an annular piston sealed off displaceably relative to the second housing bore

the other of said two piston element means is designed as a plunger piston which is arranged displaceably in a pressure-tight manner in an axial passage bore of the annular piston;

said at least one axial-force transmission element means is yoke-shaped for making a positive and non-positive motion coupling of the primary piston, limiting the first part space of the primary outlet-pressure space with only one of the two piston element means which delimits the second part space of the primary outlet-pressure space on one side;

a second axial-force transmission element means for making a positive and non-positive motional coupling of the other piston element means of the primary-piston elements, limiting the second part space with the drive piston of the brake booster; and

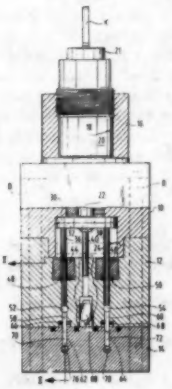
a third axial-force transmission element means, connected with the actuating force exertable by means of the brake pedal for acting directly on the yoke-shaped axial-force transmission element means in the event of a failure of the brake booster.

4,964,677

VEHICLE ANTI-THEFT SYSTEM

Bob C. Splinter, Nieuw Vennep, Netherlands, assignor to H. Van Eldern Holding B.V., Netherlands

Filed Jul. 26, 1989, Ser. No. 385,179
Int. Cl.[5] B60R *25/08*; B60T *17/16*
U.S. Cl. 303—89 **7 Claims**



1. A vehicle anti-theft system comprising in combination, a body having at least two components and means for holding said components in sealingly stacked relation, one of said components having a first passage therein and the other of said components having a second passage therein, a first bypass passage intersecting the first passage and being of a smaller diameter than said first passage, a second bypass passage in the other component aligned with said first bypass passage, actuator rod means slidable in said bypass passages between a normal position allowing free fluid flow through said bypass passages and an anti-theft position substantially blocking fluid flow through said bypass passages, said one passage having a first one-way valve passage downstream from said first bypass passage, said second passage having a second one-way valve passage aligned with said first one-way valve passage but of larger diameter than said first one-way valve passage, ball valve means in said second one-way valve passage for sealing against reverse flow of fluid through said one-way valve passages, means for seating said ball valve means against said one component, and operator actuated means for locking said actuator rod in said anti-theft position.

4,964,678

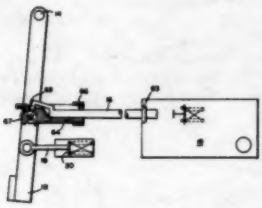
UNIVERSAL ANTI-LOCK BRAKE SWITCH LINKAGE

John C. Holloway, Cumberland, R.I., and James A. Mallett, Milton, Mass., assignors to Joseph Pollak Corporation, Boston, Mass.

Filed Jul. 11, 1989, Ser. No. 378,327
Int. Cl.[5] B60T *11/18*
U.S. Cl. 303—91 **7 Claims**

1. In a vehicle having rotatable wheels, a braking system for said wheels including a brake pedal mounted for travel of a given length, a connecting linkage, a switch operable to change states as said brake pedal reaches a predetermined point in said travel, a pin fixed to said brake pedal, said connecting linkage being variable in length and having one end thereof operatively connected to said switch and an opposite end

engageable by said pin, and a latch normally preventing said linkage from changing in length, said latch being displaceable



to permit said linkage to change in length upon engagement of said pin by said opposite end of said linkage.

4,964,679

MONITORING METHOD AND APPARATUS FOR A BRAKE SYSTEM OF HEAVY-DUTY VEHICLES

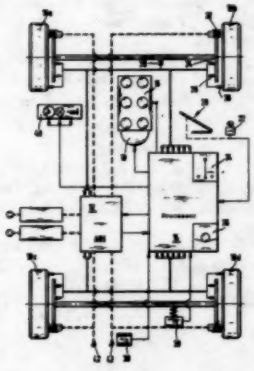
Heinrich-Bernhard Rath, Vallendar, Fed. Rep. of Germany, assignor to Lucas Industries Public Limited Co., West Midland, United Kingdom

Filed Feb. 23, 1989, Ser. No. 314,019

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1988, 3805589

Int. Cl.[5] B60T *8/32*; B60Q *1/50*

U.S. Cl. 303—100 **3 Claims**



1. A method of monitoring a brake system in a heavy-duty vehicle, the method comprising the steps of

measuring the velocity (V) of the vehicle,

measuring the inclination (N) of the roadway,

measuring the axle load (A),

measuring the transverse acceleration (Q) of the vehicle,

measuring the temperature (T) of the brakes,

measuring the condition of wear (S) of the brakes,

measuring the condition (P) of a brake pressure source, and

measuring the tire pressure (P_R) of the tires of the vehicle, and

determining on the basis of said measured velocity (V), inclination (N), axle load (A), transverse acceleration (Q), temperature (T), wear (S), condition (P) of a brake pressure source, and tire pressure (P_R), a stopping distance (X_{ist}) to be expected,

comparing said stopping distance (X_{ist}) to be expected with a maximum permissible stopping distance (X_{soll}), and

generating a warning signal if said stopping distance (X_{ist}) to be expected exceeds said maximum permissible stopping distance (X_{soll}).

4,964,680

FLOW CONTROL VALVE FOR ANTILOCK BRAKE CONTROL DEVICE

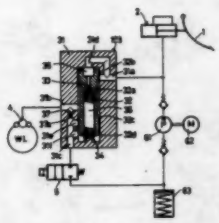
Seiji Nokubo; Teruhisa Kohno; Koichi Hashida; Atsuo Matsumoto, and Hideaki Higashimura, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 5, 1989, Ser. No. 417,425

Claims priority, application Japan, Oct. 7, 1988, 63-254600

Int. Cl.[5] B60T *8/42*

U.S. Cl. 303—115 **1 Claim**



1. In a flow control valve for antilock control, comprising:

a housing having an inlet port communicating with a pressure source, an outlet port communicating with a wheel brake and a discharge port communicating with a reservoir circuit having a normally closed shutoff valve,

a spool slidably mounted in said housing and having a pressure input chamber communicating with said input port at one end thereof, a pressure reducing chamber communicating with said discharge port at the other end thereof, and a fluid passage with an orifice for communicating said pressure input chamber with said pressure reducing chamber, and

a spring for biasing said spool toward said pressure input chamber,

said spool having a first position at the side of said pressure input chamber where said inlet port communicates with said outlet port through a large-flow channel and a second position at the side of said pressure reducing chamber where said inlet port communicates with said outlet port through a restricted-flow channel including said orifice, said large-flow channel being adapted to be closed by a first closing portion when said spool is moved from said first position toward said pressure reducing chamber, said restricted-flow channel being adapted to be closed by a second closing portion when said spool is in said first position, said spool being adapted to be located in said first position when antilock control is not activated, to move from said first position toward said second position owing to a pressure difference between said pressure input chamber and said pressure reducing chamber when said shutoff valve is opened to activate antilock control, and to move from said second position toward said first position when the pressure difference between said inlet port and said outlet port gets lower than a predetermined value,

said flow control valve characterized in that there is provided a throttle for communicating said outlet port with said discharge port, said throttle having such a sectional area that the pressure difference between said pressure input chamber and said pressure reducing chamber will be kept large enough to move said spool from said first position toward said second position when said shutoff valve is opened.

4,964,681

ANTI-LOCK HYDRAULIC BRAKE SYSTEM

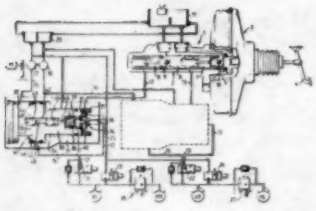
Jochen Burgdorf, Offenbach-Rumpenheim; Hans-Dieter Reinartz, Frankfurt am Main; Helmut Steffes, Hattersheim; Holger Von Hayn, Bad Vilbel; Peter Volz, Darmstadt; Hans Wupper, Freidrichsdorf; Gunther Buschmann, Griesheim; Erhard Beck, Weilburg; Gottfried Dehio, Frankfurt am Main; Dieter Dinkel, Eppstein/Ts., and Juergen Rausch, Eschborn, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 21, 1989, Ser. No. 383,775

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1988, 3827366

Int. Cl.[5] B60T *8/40*

U.S. Cl. 303—116 **27 Claims**



1. An anti-lock hydraulic brake system having a master brake cylinder **(2)**, a pump unit **(17, 18)**, a supply reservoir **(11)** and at least one wheel brake, a brake line between the master brake cylinder **(2)** and the wheel brake into which an inlet valve **(21, 22)** is inserted, a relief line **(25)** between the supply reservoir **(11)** and the wheel brakes into which an outlet valve **(23, 24)** is inserted, a pressure line **(15, 16)** from the pump unit **(17, 18)** to the brake line **(12, 13)**, said system comprising, in combination: a separating valve **(14)** in the brake line **(12, 13)** between the master brake cylinder **(2)** and the point where the pressure line **(15, 16)** terminates into the brake line, which valve is switched by pump pressure to assume its closed position, and a regulating valve **(19)** for generating a pump pressure in the pressure line **(15, 16)** proportional to the pressure in the master brake cylinder **(2)**, wherein the valve passage **(36)** of the separating valve **(14)** is operatively coupled to, communicates with, and is aligned with the valve passage **(49)** of the regulating valve **(19)**.

4,964,682

MULTIPLE PURPOSE FURNITURE UNIT

Anthony P. Thomas, 1037 Lafayette Ct., Collinsville, Ill. 62234

Filed Oct. 10, 1989, Ser. No. 419,024

Int. Cl.[5] A47B *47/00*

U.S. Cl. 312—138.1 **16 Claims**

1. A multiple purpose furniture unit comprising:

a bottom having a top surface and a bottom surface, the bottom surface for resting on a floor, the bottom of generally rectangular shape;

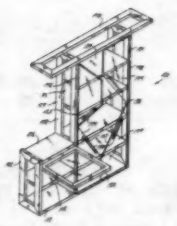
a panel for placing on the top surface of the bottom and perpendicular to the top surface of the bottom, the panel having a first side and a second side, a bottom edge and a top edge, the bottom edge being placed on the top surface;

a first post for placing on the top surface of the bottom and perpendicular to the top surface of the bottom, the first post positioned opposite the first side, the first post being generally circular in cross section and having a top end;

a second post for placing on the top surface of the bottom and perpendicular to the top surface of the bottom, the second post positioned opposite the second side, the second post being generally circular in cross section and being smaller in height than the first post;

a first shelf member connected to the first side of the panel and the first post in a spaced apart relationship above the top surface of the bottom, the first shelf member being rectangular in shape;

a second shelf member connected to the second side of the panel and the second post, the second shelf member being spaced above the top surface of the bottom, the second shelf member being rectangular in shape and having a bottom surface and a front edge;



a desk top being generally rectangular in shape and having a top surface and the top surface of the desk top being connected to the bottom surface of the second shelf member at the front edge and extending away from the second shelf member; and

a top having a top side and a bottom side, the top connected to the top edge of the panel and the top end of the first post, the top positioned above the first shelf members.

4,964,683

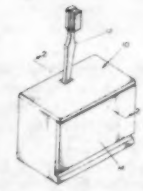
PILL REMINDER APPARATUS

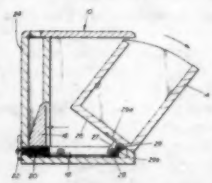
Steven L. Sugarek, 910 Buoy Rd., Houston, Tex. 77062, and Chester A. Sugarek, Jr., 6605 Rowan La., Houston, Tex. 77074

Continuation of Ser. No. 411,696, Sep. 25, 1989, abandoned. This application Jun. 11, 1990, Ser. No. 536,952

Int. Cl.[5] A46B *17/00*

U.S. Cl. 312—207 **2 Claims**





1. A pill reminder apparatus, comprising:

a first housing having a cover, wherein said cover has an opening for receiving the handle of a toothbrush;

a second housing for storing pills and having a first and second positions within said first housing; and

means totally internal of said first housing and automatically responsive to the removal of said toothbrush from said apparatus for automatically causing said second housing to move from said first position to said second position as the result of the toothbrush handle being removed from the apparatus, said second position providing access to any pills stored within said second housing.

4,964,684

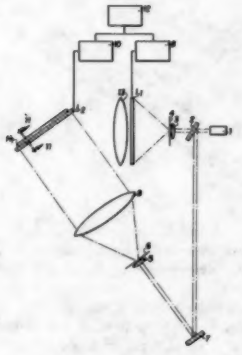
HOLOGRAPHIC IMAGE RECORDING USING LIQUID CRYSTAL

John Iovine, 86-03 102 St., Richmond Hill, N.Y. 11418

Filed Dec. 28, 1988, Ser. No. 291,113

Int. Cl.[5] G03H *1/30, 1/26*

U.S. Cl. 350—3.76 **1 Claim**



1. A method of constructing a multiplex hologram of two dimensional images displayed on an LCD display, comprising:

generating a series of two-dimensional images; displaying successive ones of said images on an LCD display matrix;

providing a holographic plate to be exposed;

directing an object beam of coherent radiation at the LCD display matrix so that the transmitted coherent radiation is incident on the holographic plate;

directing a reference beam of coherent radiation at the holographic plate to produce, in combination with the transmitted object beam, a holographic interference pattern on the plate; and selectively exposing portions of the plate, through slit apertures in a second LCD display matrix, said portions corresponding to successive ones of the images to form a multiplex hologram on the plate.

4,964,685

CONNECTOR WITH PRECISION FIBER OPTIC ALIGNMENT CLAMP

Wallace R. Savitsky; Ronald R. Schaffer, and Gary N. Warner, all of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 29, 1989, Ser. No. 399,805

Int. Cl.[5] G02B *6/36*

U.S. Cl. 350—96.2 **19 Claims**

1. A connector for an optical fiber cable, comprising;

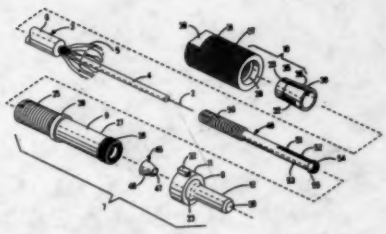
an alignment ferrule having a passageway,

buffer clamping means extending in the passageway including a collet clamping portion secured to a buffer surrounding an optical fiber of an optical fiber cable,

a tip on a front end of the alignment ferrule having a mating face receiving the optical fiber projecting from the buffer and from the buffer clamping means,

camming means engaging the buffer clamping means for camming the collet clamping portion on the buffer,

means on the buffer clamping means rearward of the collet clamping portion for being secured to the interior of the alignment ferrule,



cable clamping means for closing onto and clamping the cable, and

locking means for movement forwardly along a rear of the alignment ferrule to provide resistance to disengagement of the buffer clamping means and the alignment ferrule.

4,964,686

FINDER OPTICAL DEVICE

Masatake Kato, Tokyo, Japan, assignor to Canon Kabushiki Kaishi, Tokyo, Japan

Filed Dec. 6, 1988, Ser. No. 280,584

Claims priority, application Japan, Dec. 14, 1987, 62-315549; Sep. 19, 1988, 63-234159

Int. Cl.[5] G02B *23/14, 9/06, 25/00*; G03B *13/06*

U.S. Cl. 350—561 **9 Claims**

1. A finder optical device comprising:

an objective lens unit having a positive refractive power and comprising two lenses of positive refractive power;

a relay lens unit for relaying and re-forming an image formed by said objective lens unit and comprising a cemented lens comprised of a negative lens of negative refractive power and a positive lens of positive refractive power;

a field lens unit positioned in the neighborhood of an image plane of said relay lens unit; and

an eyepiece lens unit for observation of an image formed by said relay lens and comprising two positive lenses of positive refractive power,

wherein the following conditions are satisfied:

$$1.0<f_R/f_T<1.8$$

$$1.0<f_F/f_E<1.7$$

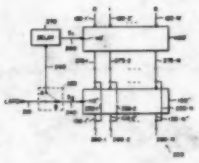
where f_T, f_R, f_F, f_E are respectively focal lengths of said objective lens unit, said relay lens unit, said field lens unit and said eyepiece lens unit.

4,964,687

OPTICAL LATCH AND METHOD OF LATCHING DATA USING SAME

R. Aaron Falk, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1989, Ser. No. 414,016
Int. Cl.[5] G02B 6/10; G06E 1/04; G11C 21/00; H03K 17/80
U.S. Cl. 350—96.13 13 Claims



1. An optical latch comprising:

a first optical switch which receives a plurality of first optical switch input signals, said first optical switch transmitting said plurality of first optical switch input signals on first optical switch output signal lines when a first switch signal is in an active state, said first optical switch not transmitting said plurality of first optical switch input signals cu: said first optical switch output signal lines when said first switch signal is in an inactive state;

a second optical switch having second optical switch input signal lines connected to said first optical switch output signal lines, said second optical switch transmitting second optical switch input signals received via said second optical switch input signal lines on second optical switch output signal lines when a second switch signal is in an active state, said second optical switch not transmitting said second optical switch input signals on said second optical switch output signal lines when said second switch signal is in an inactive state; and

a plurality of feedback signal lines to transmit optic signals from said second optical switch output signal lines to said second optical switch input signal lines.

9. A method of latching optical data comprising the steps of:

(a) receiving a plurality of input signals in a first optical switch;

(b) passing said plurality of input signals to a second optical switch when a first switch signal is active;

(c) transmitting feedback signals from an output of said second optical switch to an input of said second optical switch when a second switch signal is active such that said output of said second optical switch is held; and

(d) transmitting output signals from said second optical switch.

4,964,688

FIBER OPTIC CONNECTOR ELEMENT AND METHOD FOR ITS USE

Kevin G. Caldwell; Steve J. Lischynsky, and Elza V. Seregelyi, all of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 247,465, Sep. 22, 1988, Pat. No. 4,877,303. This application Jul. 27, 1989, Ser. No. 385,844
Int. Cl.[5] G02B 6/26; B65H 69/02; C03B 23/20
U.S. Cl. 350—96.20 8 Claims

1. An optical fiber connector element for terminating an optical fiber cable, the connector element comprising:

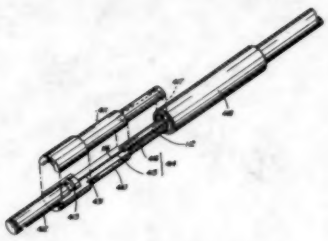
a ferrule having an axial bore extending therethrough;

an optical fiber stub secured within the axial bore of the ferrule, the stub having a forward end surface which has an optical finish and a projecting portion which projects rearward from the ferrule for splicing to an end portion of a fiber of the optical fiber cable; and

a cable mount part which is securable to the ferrule to extend rearward of the ferrule, the cable mount part comprising a base member and a cover member for mating with the base member to secure the projecting portion of the stub and the end portion of the fiber between the base member and the cover member, at least one of the base member and the cover member having a deformable material at a mating surface of that member for deforming to substantially surround the projecting portion of the stub and the end portion of the fiber when the cover member is mated with the base member.

8. A method for terminating a fiber optic cable with a fiber optic connector element, the method comprising:

providing a connector element comprising a ferrule having an axial bore, an optical fiber stub secured within the axial bore of the ferrule, projecting rearward from the ferrule and having a forward end surface having an optical finish,



and matable base and a cover members, at least one of which has a deformable material at a mating surface of that member;

cutting the cable to a desired length;

stripping back an end portion of protective material surrounding an optical fiber of the cable to expose an end portion of the optical fiber;

splicing the fiber stub to the exposed fiber end portion;

mating the base and cover members with the spliced fiber stub and fiber end portion between the base and cover members to deform the deformable material around the spliced fiber stub and fiber end portion and to secure the spliced fiber stub and fiber end portion between the mated base and cover members;

fitting a crimp sleeve over the base member and cover member when the cover member is mated with the base member; and

compressing the crimp sleeve onto the mated cover member and base member.

4,964,689

CONNECTOR FOR SPLICING OPTICAL FIBERS

Howard Wichansky, Freehold, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 7, 1978, Ser. No. 958,595
Int. Cl.[5] G02B 6/38
U.S. Cl. 350—96.21 5 Claims

1. A connector for splicing optical fibers comprising a sleeve, at least one precision cut axial bore provided in said sleeve, funnel-shaped openings provided at each end of said

sleeve communicating with said bore, said openings facilitating the insertion of the ends of the optical fibers to be spliced into said sleeve, the diameter of said bore providing a close fit for said fibers and having a minimum value within fabrication tolerance equivalent to the diametrical upper tolerance of the fibers to be spliced, a pair of optical fibers positioned within respective sleeve ends so that said fiber ends abut, means at the ends of said sleeve for securing said fibers therein, said means including means positioned around the fiber within at least one of said funnel-shaped openings and spaced from the abutting ends for holding a respective fiber in said sleeve, a bonding agent applied to the throat of at least one of the funnel-shaped openings for securing the respective fiber to said sleeve, wherein one of said fibers is secured to said sleeve, a shell secured to the other of said fibers, one end of said sleeve abutting an end of said shell in face-to-face relationship, and having a retaining clip secured to said sleeve and said shell for holding the sleeve and shell in said face-to-face relationship.

4,964,690

PIN-AND-SOCKET CONNECTOR FOR LIGHT WAVE CONDUCTORS

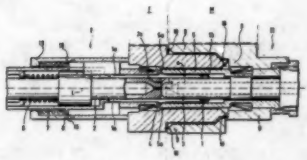
Jürgen Lappöhn, Heiningen, and Franz Czeschka, Rechberghausen, both of Fed. Rep. of Germany, assignors to ERNI Elektroapparate GmbH, Adelberg, Fed. Rep. of Germany

Filed Jun. 9, 1989, Ser. No. 364,647

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1988, 3819621

Int. Cl.[5] G02B *6/38*

U.S. Cl. 350—96.21 **8 Claims**



1. Connector for axially aligning light wave conductors such as fiber optic conductors which each have at least one end comprising:

socket means for supporting an end of at least a first light wave conductor in a first predetermined position; and

plug means defining a longitudinal axis and configured to be releasably connected to said socket means for supporting an end of at least a second light wave conductor in a second predetermined position;

said plug means including guide sleeve means extending adjacent at least a portion of said longitudinal axis to facilitate said releasable connection of said socket means to said plug means;

said guide sleeve means including an at least partially generally conically configured first aligning means adjacent at least one end of said at least second light wave conductor;

said socket means including second aligning means for being in at least partial surrounding relation with respect to said first aligning means and for being adjacent at least one end of said at least first light wave conductor and configured to cooperate with said first aligning means for relatively aligning said first predetermined position with respect to said second predetermined position to axially align an end of one of said at least first light wave conductors with an end of one of said at least second light wave conductors by said second aligning means applying a radially inward force on said first aligning means by compression action between said generally conically shaped first aligning means and said second aligning means.

4,964,691

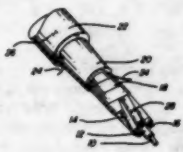
OPTICAL FIBER CABLE HAVING OPTICAL FIBERS WITH VARIOUS LENGTHS

John C. Nelson, and Kenneth E. Cornelison, both of Hickory, N.C., assignors to Alcatel NA, Inc., Hickory, N.C.

Filed May 24, 1989, Ser. No. 356,757

Int. Cl.[5] G02B *6/44*

U.S. Cl. 350—96.23 **20 Claims**



1. An optical fiber cable having a predetermined length, comprising:

a cable jacket of said predetermined length and having first and second ends;

a plurality of optical fibers disposed within and enclosed by said cable jacket, said fibers having first and second ends, the first end of each said fiber being coincident with the first end of said cable jacket, said fibers having various lengths such that the second ends of said fibers are located at various positions along the length of said cable, at least one of said second ends being at a position enclosed by the cable jacket; and

first indicia disposed on an outer surface of said cable jacket identifying the positions of the second ends of said fibers.

4,964,692

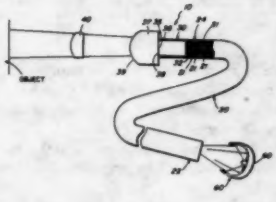
FIBER BUNDLE ILLUMINATION SYSTEM

Rochelle Prescott, Arlington, Mass., assignor to Smith & Nephew Dyonics, Inc., Andover, Mass.

Continuation of Ser. No. 400,395, Jul. 21, 1982, abandoned, which is a continuation-in-part of Ser. No. 188,761, Sep. 19, 1980, abandoned. This application Aug. 7, 1985, Ser. No. 763,401

Int. Cl.[5] G02B *6/04*

U.S. Cl. 350—96.24 **17 Claims**



1. A system for projecting uniform illumination for visual observation, comprising:

a flexible, elongated light guide comprising a bundle or relatively small, discrete clad fibers,

said bundle having an input end adapted to receive light from a primary light source, and an output end from which light is transmitted,

said fibers of said bundle along their length being independent from one another to permit flexing,

output end portions of said fibers being joined together

into an array to cooperatively define an output face of said fiber bundle,

said system causing the ends of the individual clad fibers to transmit light through said output face with non-uniform brightness across said face,

a clad cane element having an input face and an output face,

said cane element input face corresponding to said output face of said fiber bundle in size and positioned to receive substantially all light transmitted through said output face of said fiber bundle, said output face of said cane element adapted to direct light through the remaining part of said illumination system,

said cane element comprising a transparent homogeneous core, sized to receive substantially all light transmitted through said output face of said fiber bundle,

the substance of said core having a relatively high refractive index,

the exterior of said core being surrounded with a relatively thin clad layer of substance having a relatively low refractive index whereby light proceeding through said core is subject to internal reflection from the clad,

said cane element having a predetermined length enabling light rays entering said core to be internally mixed to provide uniform brightness across said output face of said clad cane element,

a first lens means located downstream from said output face of said clad cane element at a distance therefrom at least equal to the effective focal length of said lens means,

said first lens means receiving said light of uniform brightness projected from said output face of said cane element and focusing the image of said output face of said cane element to provide a projected beam for illumination of an object to be viewed.

4,964,693

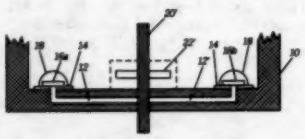
RADIO HAVING OPTICAL CONTROLS AND METHOD OF OPTICALLY CONTROLLING SAME

M. William Branan, Jr., Plantation, and John D. Wetters, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 28, 1989, Ser. No. 329,745

Int. Cl.[5] G02B *6/02, 5/22;* H01J *5/16;* G02F *1/00*

U.S. Cl. 350—96.29 **19 Claims**



1. An optically controlled device, comprising:

an optical communication channel formed at least in part within at least a portion of a housing for the optically controlled device;

means for transmitting an optical signal via said optical communication channel to provide a transmitted optical signal;

means for attenuating said transmitted optical signal to provide an attenuated optical signal;

means for receiving said attenuated optical signal and for controlling at least one operational parameter of the device in response thereto.

17. A method for optically controlling a device, comprising the steps of:

(a) transmitting an optical signal into a optical communication channel formed at least in part within at least a portion of a housing for the optically controlled device;

(b) attenuating at least a portion of said to provide an attenuated optical signal;

(c) receiving said attenuated optical signal and converting said attenuated optical signal into an electrical signal;

(d) processing said electrical signal and controlling at least one operational parameter of the device in response thereto.

4,964,694

OPTICAL FIBER AND APPARATUS FOR PRODUCING SAME

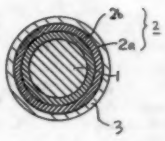
Keiji Ookashi, Sakura; Hideo Suzuki, Funabashi; Shinji Araki, and Tsuyoshi Shimomichi, both of Sakura, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed Jul. 17, 1989, Ser. No. 380,961

Claims priority, application Japan, Jul. 26, 1988, 63-186467; Sep. 9, 1988, 63-226022; Jan. 12, 1989, 1-5535; Apr. 28, 1989, 1-109572

Int. Cl.[5] G02B *6/22*

U.S. Cl. 350—96.33 **12 Claims**



3. An optical fiber comprising

(1) an inner carbon coating layer formed over an uncoated surface of the optical fiber by thermally decomposing a compound selected from the group consisting of an aromatic and halogenated aromatic hydrocarbon compound, and

(2) an outer carbon coating layer formed over the inner carbon coating layer by thermally decomposing a compound selected from the group consisting of an aliphatic and halogenated aliphatic hydrocarbon compound.

4,964,695

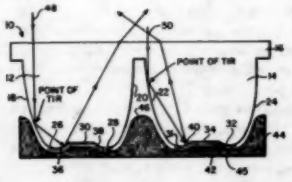
LENTICULAR ARRAYS FOR FRONT PROJECTION SCREENS AND CONTRAST IMPROVING METHOD AND DEVICE

Ralph H. Bradley, Jr., Kingsport, Tenn., assignor to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 236,562, Aug. 25, 1988, abandoned, which is a continuation-in-part of Ser. No. 107,087, Oct. 6, 1987, Pat. No. 4,767,186. This application Oct. 2, 1989, Ser. No. 418,697

Int. Cl.[5] G03B *21/60*

U.S. Cl. 350—129 **25 Claims**



1. Method for making a light absorbing screen which includes a lenticular surface having a plurality of lenticules separated by grooves, the method comprising the steps of:

creating a structure having a base, and ribs having light absorbing portions protruding from said base;

aligning said ribs with said grooves so that said ribs project into said grooves; and

joining the so-aligned structure to said surface having said

lenticules, whereby said structure will absorb undesired light passing into said grooves.

4,964,696

COLOR SEPARATING OPTICAL APPARATUS

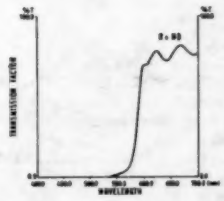
Minoru Suzuki; Nobutaka Minefuji, both of Tokyo, and Osamu Fujimoto, Osaka, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo and Sharp Kabushiki Kaisha, Osaka, both of, Japan

Filed Jan. 11, 1989, Ser. No. 295,672

Claims priority, application Japan, Jan. 12, 1988, 63-4424; Jun. 3, 1988, 63-73987[U]

Int. Cl.[5] G02B *5/22*

U.S. Cl. 350—315 4 Claims



1. A color separating optical apparatus, comprising: an imaging lens unit having an optical axis for collecting and focussing light reflected from an object illuminated with a light source; light-receiving means disposed at a position generally conjugate to the object and receiving focussed light; a plurality of color separating filters selectively inserted into the optical path extending between said object and said light-receiving means which respectively limit the wavelengths of light components passing therethrough such that the light components reaching said light-receiving means are at wavelengths in respectively different ranges, and a plurality of light-shielding means selectively inserted into said optical path for adjusting the luminous flux of light transmission, said light-shielding means being selected in accordance with the selection of said color-separating filters so as to eliminate the difference in output energies of each separated color attributable to the spectral characteristics of said light source and said light-receiving means, wherein said light-shielding means are disposed at a position distant from said imaging lens unit and are constructed to block the central portion of the beam of said light in a greater amount than peripheral edges thereof.

4,964,697

LENS BARREL HAVING CIRCUIT BOARD WITH POLYGONAL APERTURE

Yutaka Fuziwara, Kanagawa, Japan, assignor to Canon Kabushiki Kaishi, Tokyo, Japan

Filed Nov. 22, 1988, Ser. No. 274,959

Claims priority, application Japan, Nov. 27, 1987, 62-299016

Int. Cl.[5] G02B *5/00, 27/00*

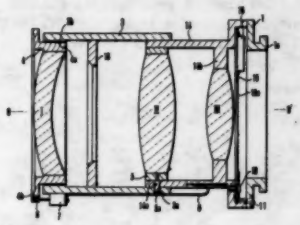
U.S. Cl. 350—319 13 Claims

1. A lens barrel comprising:

a lens group with an optical axis,

a body member supporting said lens group, and

a circuit board having an aperture which allows a light beam from a photographed object to pass therethrough, said aperture having a substantially polygonal shape which substantially coincides with an area of said light beam effective in forming an image on a recording portion including a film plane or an image sensing plane, said



aperture of said circuit board being arranged within said body member and on the optical axis of said lens group.

4,964,698

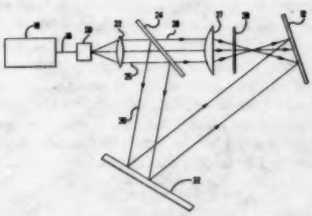
SYSTEM FOR SELECTIVE LASER ASSISTED PLATING

John R. Rowlette, Clemmons, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 22, 1989, Ser. No. 411,355

Int. Cl.[5] G02B *27/00;* G03H *1/28*

U.S. Cl. 350—320 6 Claims



1. A method of improving a surface of a metallic workpiece for subsequent selective metal plating thereof, where at least one workpiece is joined to a carrier strip, comprising the steps of

a) positioning a pulsed laser, operating at a predetermined pulsing rate, near said workpiece,

b) preparing a hologram capable of splitting a radiation beam of said pulsed laser,

c) placing said hologram intermediate said pulsed laser and said workpiece,

d) directing the radiation beam of said pulsed laser towards said hologram and said carrier strip, where said hologram is within a radiation path between said pulsed laser and said carrier strip,

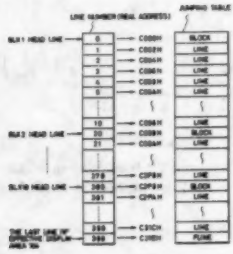
e) splitting the radiation beam at said hologram into a plurality of radiation beams directed towards said metal workpiece, and

f) coordinating the movement of said carrier strip with the pulsing rate of said laser so that a respective one of said plurality of radiation beams affects at least one said metal workpiece as said metal workpiece moves past said hologram.

4,964,699
DISPLAY DEVICE

Hiroshi Inoue, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1988, Ser. No. 174,980
Claims priority, application Japan, Mar. 31, 1987, 62-076357
Int. Cl.[5] G02F 1/13; G09G 3/36
U.S. Cl. 350—332 13 Claims



1. A display control unit comprising:

display means having a plurality of scanning electrodes arranged in a horizontal direction and a plurality of signal electrodes separately arranged in a vertical direction with a predetermined spacing, and a liquid crystal having a memory function and being disposed between said electrodes;

memory means for storing data for selecting either of when said scanning electrodes are driven in units of blocks each comprising several scanning electrodes divided from said plurality of scanning electrodes and when said scanning electrodes are driven for every one line of scanning electrode;

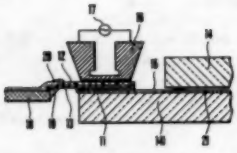
supply means for supplying access data for designating a line of said scanning electrodes to be accessed; and

control means, responsive to data stored in said memory means that indicates said scanning electrodes are driven in units of blocks, for driving said scanning electrodes in a block when the access data supplied by said supply means designates a head line in the block, and otherwise driving a line designated by the access data to display the image data applied to said signal electrodes.

4,964,700
CONNECTION STRUCTURE BETWEEN A LIQUID CRYSTAL PANEL AND AN EXTERNAL CIRCUIT

Hiroshi Takabayashi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 207,231, Jun. 16, 1988, abandoned.
This application Dec. 8, 1989, Ser. No. 445,944
Claims priority, application Japan, Jun. 19, 1987, 62-153016
Int. Cl.[5] G02F 1/13
U.S. Cl. 350—336 43 Claims



1. A liquid crystal apparatus comprising:

(a) a liquid crystal panel having a chiral smectic liquid crystal developed by temperature decrease from a first temperature higher than a second temperature which develops a chiral smectic phase;

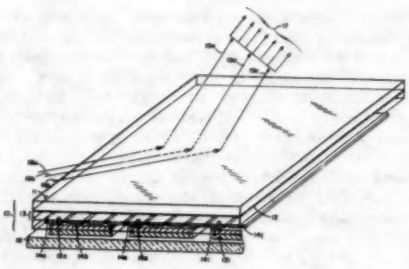
(b) a driving circuit for driving said liquid crystal panel; and

(c) connecting means for electrically connecting said liquid crystal panel and said driving circuit, comprising a first terminal provided on said liquid crystal panel, a second terminal provided on said driving circuit, and a thermoset film containing plural dispersed conductor particles, disposed between said first and second terminals.

4,964,701
DEFLECTOR FOR AN OPTICAL BEAM

Terry A. Dorschner, Newton Centre, and Daniel P. Resler, Wilmington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 4, 1988, Ser. No. 253,021
Int. Cl.[5] G02F 1/13
U.S. Cl. 350—336 22 Claims



1. Apparatus for deflecting on optical beam, said apparatus comprising:

an optical element including a first window having an optically-transparent common electrode, a second window having a multiplicity of electrodes in the form of electrically-isolated parallel stripes, and a layer of liquid crystal molecules intermediate said first and second windows,

said optical element positioned so that said optical beam is incident on said first window, said beam being reflected from within said optical element;

means for generating a multiplicity of control signals; and

means for applying said control signals individually between said multiplicity of stripe electrodes and said common electrode, thereby creating local variations of refractive index in said liquid crystal layer, said applying means comprising:

an electrically-insulating layer affixed to said optical element opposite said first window;

a multiplicity of electrically-conductive contact pads on an external surface of said insulating layer, each of said pads underlying a plurality of said stripe electrodes; and

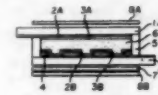
a multiplicity of conductors, each extending through said insulating layer for providing electrical conductivity between an individual stripe electrode and a corresponding pad.

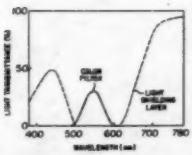
4,964,702

LIQUID CRYSTAL DISPLAY DEVICE HAVING A LIGHT SHIELDING LAYER BEING A COMPLEMENTARY COLOR TO THE COLOR FILTER

Yoshio Sugimoto, Yokohama; Ryujiro Muto, Nishinomiya, and Takeji Arakaki, Amagasaki, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Mar. 21, 1989, Ser. No. 326,649
Claims priority, application Japan, Mar. 24, 1988, 63-68245
Int. Cl.[5] G02F 1/13
U.S. Cl. 350—339 R 13 Claims





1. A liquid crystal display device of negative display type, which comprises:

a liquid crystal cell comprising a nematic liquid crystal layer sandwiched between substrates provided with electrodes, a color filter placed outside said substrates and a light shielding layer placed between said substrates and covering the area, other than the area corresponding to a display pattern, wherein said light shielding layer is a complementary color to said color filter,

a pair of polarizing films arranged at both surfaces of said liquid crystal cell, and

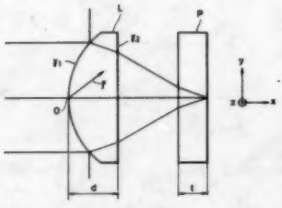
a driving means for applying a voltage to said electrodes.

4,964,703

IMAGE-FORMING LENS

Shigeyuki Suda, Machida, and Jun Hattori, Atsugi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 129,368, Nov. 30, 1987, abandoned, which is a continuation of Ser. No. 927,869, Nov. 7, 1986, abandoned. This application May 30, 1989, Ser. No. 358,497
Claims priority, application Japan, Nov. 22, 1985, 60-263078
Int. Cl.[5] G02B 3/00
U.S. Cl. 350—413 14 Claims



1. A refractive index distribution lens comprising:

a first surface defined by a convex-spherical surface with a vertex, said first surface lying on the object side when said lens is used to provide negative magnification;

a second surface defined by a flat surface, said second surface lying on the image side when said lens is used to provide negative magnification; and

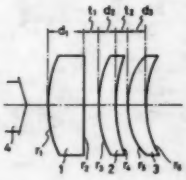
a refractive index distribution formed in the interior of said lens, said refractive index distribution having a sphere-symmetrical distribution about a point in the vicinity of the vertex of said first surface.

4,964,704

OPTICAL SYSTEM FOR USE OF A LASER PROCESSING MACHINE

Hisato Shinohara, Sagamiwara, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Continuation of Ser. No. 188,457, Apr. 29, 1988, abandoned. This application Aug. 17, 1989, Ser. No. 395,153
Claims priority, application Japan, May 1, 1987, 62-108674
Int. Cl.[5] G02B 3/06
U.S. Cl. 350—433 6 Claims



1. An optical system for use with a laser processing machine comprising at least:

first, second and third optical lens means arranged in this order from the light incidence side, each lens means having the same function as a lens comprising a front convex surface in the light incidence side and an opposite surface whose radius of curvature is larger than that of said convex surface,

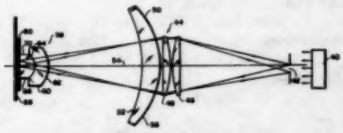
wherein the radius of curvature in the incidence side of the lens corresponding to said third optical lens means is less than that of the lens corresponding to said second optical lens means.

4,964,705

UNIT MAGNIFICATION OPTICAL SYSTEM

David A. Markle, Saratoga, Calif., assignor to General Signal Corporation, Stamford, Conn.

Filed Nov. 7, 1988, Ser. No. 267,965
Int. Cl.[5] G02B 17/00
U.S. Cl. 350—442 26 Claims



1. A photolithographic projection optical system comprising:

a source of exposure energy for generating a beam of energy;

an optical element located in the path of said beam for receiving said beam of energy and passing only a portion of said beam therethrough;

a refractive lens group located in the path of said portion of said beam for receiving and transmitting said portion of said beam of energy;

a reticle element located in the path of said portion of said beam, said reticle element having a uniform thickness and having a pattern on one surface thereof, and an unpat-

terned portion adjacent thereto, said reticle element being positioned for permitting said portion of said beam to pass through said thickness and for reflecting said portion of said beam through said thickness, and said lens group to said optical element;

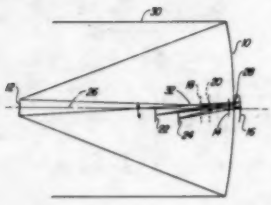
said optical element receiving said reflected beam and including means for reflecting a portion of said reflected beam back through said lens group and said unpatterned portion of said reticle element to a surface to be imaged.

4,964,706

MULTI-FOCAL LENGTH, MULTI-FIELD OF VIEW THREE MIRROR ANASTRIGMAT

Lacy G. Cook, El Segundo, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 17, 1988, Ser. No. 259,012
Int. Cl.[5] G02B *17/06, 23/06, 5/10, 7/18*
U.S. Cl. 350—505 **18 Claims**



1. A three mirror anastigmat system comprising:

a primary mirror having a central axis;

a secondary mirror facing said primary mirror, said secondary mirror being of a smaller diameter than said primary mirror and positioned substantially symmetrically about said central axis of said primary mirror such that light from a viewed object passes around and by said secondary mirror and is reflected by said secondary mirror; and

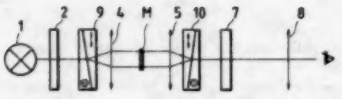
reflecting means for simultaneously reflecting light from the object being viewed to a plurality of planes for viewing, said reflecting means being positioned to receive light from said secondary mirror, said reflecting means including a plurality of tertiary mirrors of finite focal length and said plurality of tertiary mirrors forming a plurality of images of the object being viewed on said plurality of viewing planes.

4,964,707

DIFFERENTIAL INTERFERENCE MICROSCOPE

Shinichi Hayashi, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1989, Ser. No. 446,315
Claims priority, application Japan, Dec. 5, 1988, 63-307272
Int. Cl.[5] G02B *27/28, 21/14, 5/30, 1/08*
U.S. Cl. 350—510 **12 Claims**



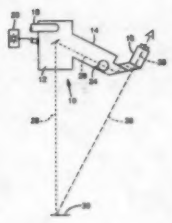
1. A differential interference microscope adapted to irradiate an object with the light emitted from a light source and transmitted through a polarizer and a beam splitter, and allow to observe the light from the object and transmitted through a compensator and an analyzer, wherein either one of said beam splitter and compensator is made of a positive birefringent substance and the other is made of a negative birefringent substance, and the optic axes of said beam splitter and said compensator are located substantially on the same plane.

4,964,708

MICROSCOPE FOR MEDICAL SURGERY

Michael S. Mason, 10950 NW. Lost Park Dr., Portland, Oreg. 97229

Filed Jul. 14, 1989, Ser. No. 380,884
Int. Cl.[5] G02B *21/20*
U.S. Cl. 350—519 **5 Claims**



1. A binocular microscope comprising;

a housing having a plurality of sections, optical elements arranged in the plurality of sections, said elements magnifying an object in a work area, and the arrangement of said optical elements in said sections defining a folded optical axis;

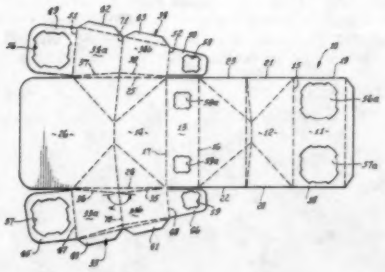
one of said sections being an eyepiece section for viewing an object in the work area through said optical elements, said eyepiece section having an optical axis which defines a projected line of sight through said eyepiece section, said projected line of sight intersecting said optical axis at the work area.

4,964,709

FOLDABLE BINOCULARS WITH ENCLOSED SIDE WALLS

Herbert W. Hoeptner, Morgan Hill, Calif., assignor to Custom Chrome, Inc., Morgan Hill, Calif.

Filed Mar. 27, 1989, Ser. No. 331,861
Int. Cl.[5] G02B *23/20*
U.S. Cl. 350—546 **16 Claims**



1. In a binoculars having lenses carried by sheet structure defining a box that is foldable between collapsed and focus adjustable extended positions, the combination comprising:

(a) said box in said focus adjustable extended positions having front and rear walls carrying said lenses,

(b) said box in extended positions having top and bottom walls each defining fold line, and also having left and right side walls defining old lines,

(c) said fold lines enabling folding of the box from said focus

adjustable extended positions to said collapsed positions, during which said top and bottom walls move relatively apart and said left and right walls move relatively toward one another,

(d) said left and right side walls having fold connection to said top and bottom walls to block light entrance into said box interior.

4,964,710

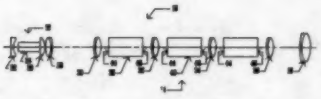
DISPOSABLE RIGID ENDOSCOPE

Dennis C. Leiner, 226 River St., Jaffrey, N.H. 03452

Filed Jul. 27, 1989, Ser. No. 385,388

Int. Cl.[5] G02B *7/02, 23/00*

U.S. Cl. 350—572 **7 Claims**



1. An endoscope for viewing an object, said apparatus including a relay lens assembly, said assembly including:

a plurality of axially aligned polymeric curved surface, spaced lenses; and

a plurality of axially aligned plano glass cylinders with polished end faces positioned intermediate said spaced lenses.

4,964,711

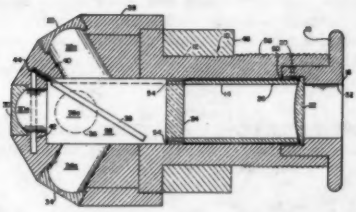
VIEWING DEVICE

Donald E. Degnan, 11 E. 47th St., New York, N.Y. 10017

Filed Feb. 9, 1989, Ser. No. 308,794

Int. Cl.[5] G02B *7/00, 9/10*; E06B *7/28*

U.S. Cl. 350—574 **4 Claims**



1. A viewing device comprising:

a. a turret at one end, said turret forming a housing to accommodate a plurality of ports within which a like number of lenses are immovably disposed;

b. a connecting tube, secured to said turret on the one end and providing a continuation of said housing for;

c. an axially extending inner tube rotatably mounted within said connecting tube, said inner tube terminating in an axially facing eyepiece and eyepiece lens at the other end,

d. a mirror swingingly mounted within a mirror retaining chamber, said chamber being created by the communication of said turret and said inner tube; and

e. a cam and a cam follower, said cam follower circumscribing a path within said cam, to position said mirror between extended and retracted conditions, and positioning said mirror within said turret so that said mirror, when extended, is analogous to and in inclined relation to said radially facing viewing ports and lens, to reflect rays entering radially through said radially facing viewing ports, and when retracted transmitting light unimpededly therethrough in an axial direction to said eyepiece.

4,964,712

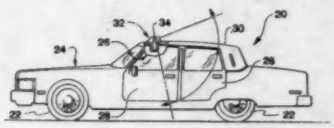
WIDE-VIEW HORIZONTAL VEHICLE SAFETY MIRROR

Allen J. Anderson, 21220 Harrow Ave., N., Forest Lake, Minn. 55025

Continuation-in-part of Ser. No. 200,547, May 31, 1988, abandoned. This application May 25, 1989, Ser. No. 357,052

Int. Cl.[5] G02B *7/18, 23/08*

U.S. Cl. 350—618 **4 Claims**



1. Vehicle rear-viewing apparatus, comprising:

(a) a plurality of elongated periscopes, each of said periscopes having an outer end and an inner end, and providing an angular field of view, each periscope including a tube mounting optics therein;

(b) a plurality of sleeves, each sleeve receiving a corresponding periscope therewithin for relative telescoping movement, to mount said periscope received therewithin with its inner end inside a wall of a vehicle with which the periscope is used, and its outer end outside said wall, wherein angular fields of view of two adjacent periscopes overlap about a first axis generally perpendicular to said wall to afford an expanded field of view about the first axis greater than that provided by each individual periscope;

(c) means mounting each sleeve for pivotal movement about a second axis generally perpendicular to the first axis;

(d) a pawl member projecting axially from each sleeve; and

(e) wherein each periscope tube comprises a main body portion received within its corresponding sleeve for relative telescoping movement, a head portion defining said outer end of the periscope tube, said head portion being disposed for rotation, with respect to an axis of elongation of the periscope tube, relative to said main body portion, and a collar carried by said head portion, said collar including a plurality of circumferentially-spaced notches formed therein, wherein, when said main body portion is moved telescopically within said sleeve to bring said sleeve into engagement with said collar, said pawl member will enter one of said notches, and rotation of said main body portion of the periscope tube about the axis of elongation will effect angular displacement of said head portion relative to said main body portion.

4,964,713

CONCENTRATOR ARRANGEMENT

Adolf Goetzberger, Merzhausen, Fed. Rep. of Germany, assignor to Fraunhofer-Gesellschaft zur Forderund der Forschung E. V., Munich, Fed. Rep. of Germany

PCT No. PCT/DE88/00688, § 371 Date Jul. 11, 1989, § 102(e) Date Jul. 11, 1989, PCT Pub. No. WO89/05463, PCT Pub. Date Jun. 15, 1989

PCT Filed Nov. 7, 1988, Ser. No. 392,976

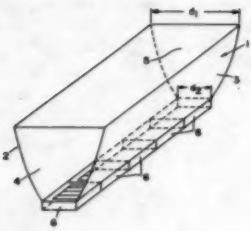
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1987, 3741477

Int. Cl.[5] G02B *17/00*

U.S. Cl. 350—629 **8 Claims**

1. A concentrator arrangement comprising a plurality of solar cells, a plate made of a transparent material with a refractive index of more than 1.45, which plate has a flat upper side

and an underside which is connected to trough-shaped non-imaging concentrator elements having parabolically curved



side walls, wherein the concentrator elements present parabolically curved mirror surfaces facing the sky.

4,964,714

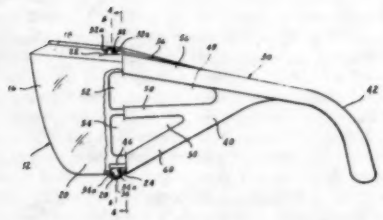
SAFETY SPECTACLES AND TEMPLE THEREFOR

Russell F. Weymouth, Jr., Charlton Depot, Mass.; John J. McNamara, Scranton, and Joseph A. Cianflone, Carbondale, both of Pa., assignors to Gentex Corporation, Carbondale, Pa.

Continuation of Ser. No. 220,792, Jul. 14, 1988, abandoned. This application Oct. 26, 1989, Ser. No. 428,038

Int. Cl.[5] G02C *11/08, 5/14;* A61F *9/02*

U.S. Cl. 351—62 **9 Claims**



1. Safety spectacles including in combination a central front having a left side and a right side, each side and having a rear edge, a left temple and a right temple, each temple extending rearwardly and having a portion abutting the rear edge of a corresponding side, each temple having a recess, each recess having a forward edge spaced inwardly of the abutting portion of the temple, each recess extending rearwardly and outwardly, and means for pivotly attaching each temple to a corresponding side, said recesses directing air forwardly and the said abutting portion providing angular stops limiting pivotal movement of the temples relative to the sides.

4,964,715

COMPARATIVE SURGICAL KERATOMETER

William D. Richards, 167 Holliston St., Medway, Mass. 02053

Continuation of Ser. No. 15,116, Feb. 17, 1987, abandoned. This application Feb. 14, 1989, Ser. No. 310,486

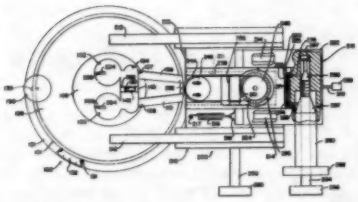
Int. Cl.[5] A61B *3/10*

U.S. Cl. 351—212 **32 Claims**

1. A keratometer for measuring the curvature of the cornea of the eye whereby an astigmatic condition may be detected and the power and angular orientation of the astigmatism may be measured, the keratometer being adapted for use with an ophthalmic surgical microscope disposed adjacent the eye and having a mounting bracket, a source of coaxial illumination and an optical system having a focal plane and objective lenses, said keratometer comprising;

illuminator means for generating a first annulus of light rays defining an annular corneal image and for causing said first annulus to pass into the focal plane of said microscope so as to permit viewing of said corneal image in the optical system of said microscope, said first annulus having radii of curvature corresponding to the radii of curvature of the cornea of said eye;

comparator means for generating a plurality of second annuli of light rays defining a corresponding respective plurality of annular comparator images, each of which images is separated from the immediately preceding and the immediately following comparator image by the ab-



sence of a comparator image, and for causing each of said plurality of comparator images to pass successively into the focal plane of said microscope so that each of said plurality of comparator images may be coaxially aligned with said firs annulus whereby said corneal image may be viewed in the optical system of the microscope and compared with successive ones of said plurality of comparator images to determine the power of the astigmatism; and

frame means for securing said illuminator means and said comparator means together in fixed spatial relation to one another and for securing said illuminator means and said comparator means to said microscope so as to permit generation of said corneal image and said comparator image.

4,964,716

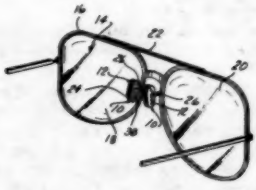
REMOVABLE COVER FOR EYEGLASS NOSE PAD

Gary D. Combs, 14090 Lenmore, Belleville, Mich. 48111

Filed Jan. 10, 1990, Ser. No. 462,758

Int. Cl.[5] G02C *5/12*

U.S. Cl. 351—139 **6 Claims**



1. A nose pad cover for a nose pad on a pair of eyeglasses comprising:

first and second members having releasably engageable portions formed of interlocking hook and pile;

means for fixedly mounting one of the first and second members on the nose pad of a pair of eyeglasses with the releasably engageable portion thereof facing away from the nose pad of the pair of eyeglasses;

a flexible sheet;

means for fixedly mounting the other of the first and second members to the flexible sheet, with the releasably engage-

able portion of the other of the first and second members facing away from the flexible sheet; and wherein

the first and second members are releasably engageable to removably mount the flexible sheet on the nose pad of the pair of eyeglasses such that the flexible sheet is positioned to contact the nose of a wearer of the pair of eyeglasses.

4,964,717

OPHTHALMIC IMAGE STABILIZATION SYSTEM

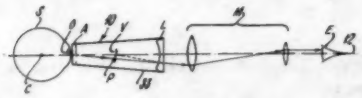
Charles J. Koester, Rock, N.J., assignor to The Trustees of Columbia University in the City of New York, New York, N.Y.

Continuation-in-part of Ser. No. 590,414, Mar. 16, 1984, Pat. No. 4,753,526. This application Jun. 27, 1988, Ser. No. 211,596

The portion of the term of this patent subsequent to Jun. 28, 2005, has been disclaimed.

Int. Cl.[5] A61B *3/10*

U.S. Cl. 351—219 **22 Claims**



1. A system for forming a stabilized image of a region of a patient's eye comprising a suport and a contact element structure which is supported by the support so as to move with small rotational eye movements transverse to an optical axis about a pivot point which is outside the eye and defined by the intersection of two axes orthogonal to the optical axis to permit rotation of the contact element structure about the two orthogonal axes, the contact element structure comprises a transparent plate having a surface shaped so as to move with a rotational action in response to the eye movements and positioned so as to contact the cornea of the eye or a lens or film covering the cornea of the eye and form the stabilized image wherein the image does not move with the eye movements.

4,964,718

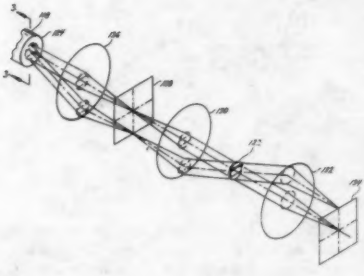
OPTICAL CORRECTOR

John A. Van Hoogstrate, St. Peters, Mo., and Richard A. Buchroeder, Tucson, Ariz., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Aug. 14, 1989, Ser. No. 393,237

Int. Cl.[5] G02B *26/08*

U.S. Cl. 353—31 **14 Claims**



1. An optical projection system comprising;

(a) an pupil surface consisting of spatially separate color segments;

(b) at least one projection means for receiving light from the pupil surface and directing the image to a projection plane; and

(c) color correcting means placed at a selective pupil image of the optical projection system that contains the spatially separate color segments of the pupil surface for shifting the image plane of at least one of the spatially separate color segments such that all the spatially separate colors have a common focus in the projection plane.

4,964,719

CONTROL METHOD OF BRIGHTNESS OF SCREEN USED FOR PROJECTION DISPLAY AND CONTROL APPARATUS OF THE SAME

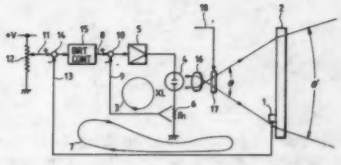
Makoto Tachikawa, Hitachi; Osamu Suzuki, Hiratsuka; Tadahiko Hashimoto, Katsuta; Kuniyuki Igari, and Ichirou Katsuyama, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 10, 1989, Ser. No. 392,011

Claims priority, application Japan, Sep. 8, 1988, 63-225271

Int. Cl.[5] G03B *2/20*

U.S. Cl. 353—85 **17 Claims**



1. A control method of brightness of a screen used for a projection display, comprising

setting in advance a relation between the magnitude of an input power to be supplied to a light source, its supply time and brightness of said light source to a relation such that brightness becomes substantially constant;

measuring actually the supply time of the input power to said light source; and

controlling the magnitude of the input power on the basis of a relation which is set in advance by said setting so that brightness becomes substantially constant.

4,964,720

EXPOSURE APPARATUS

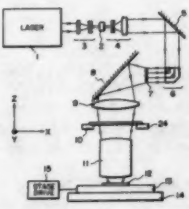
Makoto Torigoe, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1988, Ser. No. 264,078

Claims priority, application Japan, Oct. 30, 1987, 62-276716

Int. Cl.[5] G03B *21/00*

U.S. Cl. 353—122 **18 Claims**



1. An exposure apparatus for exposing a wafer to a pattern of a mask, said apparatus comprising:

a metal-vapor laser for supplying a laser beam; and

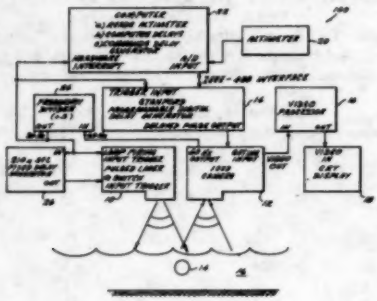
an optical arrangement for directing, through the mask, the laser beam supplied by said laser to the wafer;

wherein said optical arrangement comprises a harmonic generator for transforming the laser beam directed to the mask into a harmonic beam and for exposing the wafer to the pattern of the mask and printing the pattern of the mask onto the wafer.

4,964,721
IMAGING LIDAR SYSTEM

Bobby L. Ulich; Lonnie K. Calmes, and William P. Elkins, all of Tucson, Ariz., assignors to Kaman Aerospace Corporation, Bloomfield, Conn.

Filed Oct. 12, 1989, Ser. No. 420,247
Int. Cl.[5] G01C 3/08; H04N 7/00
U.S. Cl. 356—5 **10 Claims**



1. A method of detecting and imaging from an airborne platform an object enveloped by a backscattering medium which is at least partially transmitting to light, the airborne platform having altimeter means associated therewith, including the steps of:

selectively generating short pulses of light from the airborne platform using a pulsed light source;

projecting said short pulses of light toward the backscattering medium and at an object enveloped by the backscattering medium;

using computer means to monitor the altitude of the airborne platform in response to altitude input from the altimeter means, said altitude input being generated independently of said pulsed light source;

detecting said pulses of light reflected back from said object using camera means, said camera means being gated open by input from delay generator means, said camera means being gated open after a selected time delay corresponding to the round-trip propagation time of said light pulses to and from said object;

using said computer means to calculate said selected time delay based on input data which includes the altitude input from said altimeter means, said computer means inputting said selected time delay to said delay generator means; and

converting said detected pulses of light to a video image of said object.

4,964,722
REMOTE OBJECT CONFIGURATION/ORIENTATION DETERMINATION

Larry L. Schumacher, Newhall, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

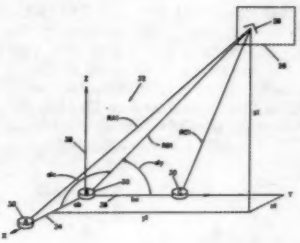
Filed Aug. 29, 1988, Ser. No. 237,035
Int. Cl.[5] G01B 11/26; G01C 1/00, 3/08
U.S. Cl. 356—152 **3 Claims**

1. The method of determining the orientation and location of an object with respect to an X, Y, Z coordinate frame comprising the steps of:

(a) equipping the exterior surface of the object with a plurality of retroreflector surfaces capable of reflecting range measuring laser beams back to their sources;

(b) locating three lasers, "A", "B", and "C", orthogonally to one another such that laser "B" defines an origin of the reference coordinate frame, laser "A" with respect to laser "B" defines an X axis, and laser "C" with respect to laser "B" defines a Y axis such that a Z axis is normal to a plane defined by the three lasers;

(c) employing the lasers to determine the range distance and angle from each of the three lasers to each retroreflector surface within the coordinate frame by reflecting laser beams from the retroreflector surfaces and then receiving



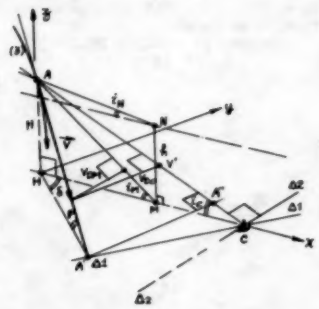
and processing reflected laser beams to develop range data; and,

(d) employing the range distance and angle data from each of the three lasers obtained from step (c) to calculate the coordinates of each retroreflecting surface within the coordinate frame whereby the orientation and location of the object within the coordinate frame is determined.

4,964,723
PROCESS AND DEVICE FOR DETECTING THE COMING INTERPOSITION OF A MASK BETWEEN AN AIRCRAFT AND A TARGET, PARTICULARLY IN A LASER-GUIDED WEAPON FIRING SYSTEM

Jean Pierre Murgue, Orleans; Robert Pressiat, Ville d'Avray, and Léon Robin, Massy, all of France, assignors to Thomson-CSF, Paris, France

Filed Aug. 1, 1986, Ser. No. 901,041
Claims priority, application France, Aug. 2, 1985, 85 11885
Int. Cl.[5] G01C 1/00; H04N 7/00; G06F 15/14
U.S. Cl. 356—141 **5 Claims**



1. Process for the detection of a coming interposition of a mask between an aircraft A and a target C, particularly in a laser-guided weapon firing system, wherein the aircraft has an automatic target tracking system providing an image of the terrain on which the target occupies a permanent fixed position, the process including detecting, during a turn carried out by the aircraft, various points M of this image, marked by an angle $i_M - i_C$ (i_M and i_C being the angular elevations of the aircraft respectively from a point M under consideration and from the target) formed between a line AM for angle i_M and AC for i_C where A is the aircraft and its projection on the

horizontal plane situated in a zone such that $i_M - i_C < 0$ and having an angular progression velocity, with respect to the target, opposite to that of the other points in that zone, at the same altitude as the target, detecting being carried out as follows:

computing at every point M in a zone of the angular progression velocity Ω_{TM}, with respect to the target, expected for the points at the same altitude as the target, using the expression $\Omega_{TM} = V/H \sin \delta \cos p(\sin i_M - \sin i_C)$ where V represents the velocity of the aircraft, H represents the height of the aircraft with respect to the target, δ represents the angle of azimuth between the aircraft-target direction and the velocity vector V of the aircraft, p represents the slope of the aircraft, or the angle between the velocity vector V of the aircraft and the horizontal plane, i_M represents the angle of elevation of the point M concerned and i_C represents the angle formed between the line AC and its projection on the horizontal plane;

measuring at all points M in said zone of the angular progression velocity, with respect to the target, actually obtained;

comparing at all points M in said zone of the two values thus obtained, a possible difference in sign signifying a coming interposition of a mask between the aircraft and the target at the level of the points M.

4,964,724

RADIATION RECEIVING MAST

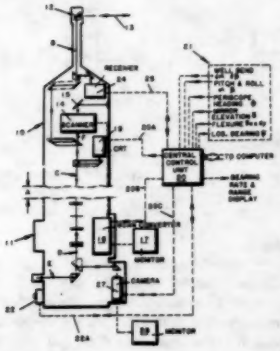
David S. Ritchie, Glasgow, Scotland, assignor to Barr & Stroud Limited, United Kingdom

Continuation-in-part of Ser. No. 268,455, Oct. 31, 1988, abandoned, which is a continuation of Ser. No. 88,018, Aug. 18, 1987, abandoned, which is a continuation of Ser. No. 788,545, Jun. 26, 1985, abandoned, which is a continuation of Ser. No. 347,018, Jan. 27, 1982, abandoned. This application Sep. 14, 1989, Ser. No. 407,718

Claims priority, application United Kingdom, Jan. 27, 1981, 8102460

Int. Cl.[5] G01B *11/26*; G02B *23/08*; G01C *9/02*

U.S. Cl. 356—152 **5 Claims**



1. A radiation receiving mast adapted to be mounted on a vehicle comprising a mast head having a image-forming radiation receiver, an information station at or near the foot of the mast, means for relaying the radiation image from the receiver to the information station, means for generating electronically a reference pattern which is stabilized in object space with respect to pitch, roll and yaw movements of the vehicle on which the mast is mounted and with respect to disturbance factors acting on the means for relaying the radiation image to the information station and means for superimposing the radiation image received from the radiation receiver on the reference pattern at the information station whereby the radiation image can be visually referenced to said pattern so that unwanted relative movements can be eliminated.

4,964,725

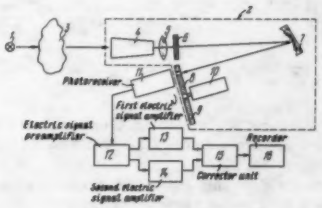
CORRELATIONAL GAS ANALYZER

Viktor L. Goldovsky, ulitsa Shopena, 18, kv. 6; Viktor I. Stetsovich, ulitsa Donskaya, 33, and Andrei J. Zayats, ulitsa Gagarina, 27a, all of Uzhgorod, U.S.S.R.

Filed Apr. 17, 1989, Ser. No. 339,498

Int. Cl.[5] G01J *3/06, 3/32*; G01N *21/35*

U.S. Cl. 356—308 **4 Claims**



1. A correlational gas analyzer, comprising:

a light source, with the beam thereof passed through the gas under study, this gas featuring a quasiperiodic pattern of the specified spectral band characterized by the number of maxima or minima and the pattern period;

an optical system positioned downstream of the gas under study with a quasiperiodic pattern of the specified spectral band and comprising sequentially positioned along the optical path:

condensor;

input slit iris;

dispersing means for decomposing the specified spectral band of the gas under study;

output slit iris, mounted rotatably and configured as a disc with a plurality of slits for scanning the specified spectral band of the gas under study and uniformly distributed along the disc circumference and equidistantly spaced from the disc center, with the spacing between the centers of adjacent slits approximately equal to the scan length in the scan plane of the specified spectral band of the gas under study, this scan plane being the focal plane of the said dispersing means of the specified spectral band of the gas under study;

a photoreceiver to receive the beam after passage of the said output slit iris;

a first electric signal amplifier with input connected to the output of said photoreceiver and designed as a tuned amplifier with the resonant frequency thereof defined by a preset relation between the disc rotation speed, the number of maxima or minima in the specified spectral band of the gas under study, and the number of slits in the plurality of slits;

a second electric signal amplifier with input connected to the output of said photoreceiver;

a corrector unit with input connected to the outputs of said first and said second electric signal amplifier;

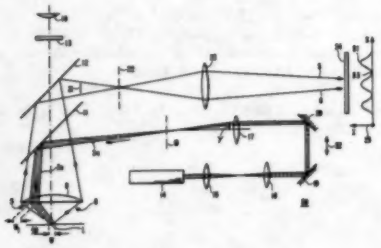
a recorder with input connected to the output of said corrector unit.

4,964,726

APPARATUS AND METHOD FOR OPTICAL DIMENSION MEASUREMENT USING INTERFERENCE OF SCATTERED ELECTROMAGNETIC ENERGY

Hans P. Kleinknecht, Bergdietikon, and Karl H. Knop, Zurich, both of Switzerland, assignors to General Electric Company, Somerville, N.J.

Filed Sep. 27, 1988, Ser. No. 250,249
Int. Cl.[5] G01B 9/02
U.S. Cl. 356—357 **56 Claims**



1. An apparatus for measuring a dimension of an object having first and second points which define the dimension, comprising:

a means for directing a beam of electromagnetic energy toward the object at a predetermined angle of incidence so that electromagnetic energy is scattered from the first and second points; and

a means for detecting the electromagnetic energy scattered from the first and second points so that the dimension may be measured, in which the means for detecting the electromagnetic energy comprises:

a means for combining the electromagnetic energy scattered from the first and second points to form at a predetermined location an interference pattern having an intensity which varies periodically in space between localized maxima and minima, the characteristics of the pattern being a function of the angle of incidence of the beam of electromagnetic energy and the dimension of the object; and

a means for observing the intensity of a predetermined portion of the interference pattern.

4,964,727

MULTI-TRACK ANALOG OPTICAL SENSING SYSTEM AND METHOD

Raymond W. Huggins, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

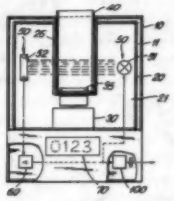
Filed Nov. 23, 1988, Ser. No. 275,208
Int. Cl.[5] G01B 11/14
U.S. Cl. 356—373 **26 Claims**

1. A sensor for use in an optical sensing system for determining a value of a measurand, the sensor comprising:

encoding means having a plurality of tracks;

illumination means for illuminating each track with an associated optical input signal, each input signal comprising light in a wavelength range different from the wavelength ranges of the other input signals; and

each track including means responsive to the value of the measurand for modulating the intensity of the associated input signal in one of N different ways to produce a corresponding modulated signal, N being greater than 2,



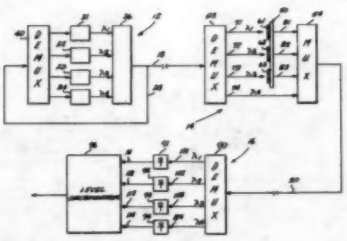
whereby the intensities of the modulated signals encode the value of the measurand.

4,964,728

BLOOD COAGULATION TIME MEASURING DEVICE

Bernd Kloth, and Holger Behnk, both of Hamburg, Fed. Rep. of Germany, assignors to Firma Labor Laborgeräte'Analysensysteme Vertriebegesellschaft mbH, Hamburg, Fed. Rep. of Germany

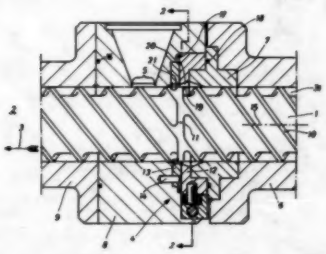
Continuation-in-part of Ser. No. 774,176, Sep. 9, 1985, abandoned, which is a continuation of Ser. No. 663,830, Oct. 23, 1984, abandoned, which is a continuation-in-part of Ser. No. 452,784, Dec. 27, 1982, abandoned, which is a continuation of Ser. No. 381,467, May 24, 1982, abandoned, which is a continuation of Ser. No. 101,078, Dec. 7, 1979, abandoned, which is a continuation of Ser. No. 876,507, Feb. 9, 1978, abandoned.
This application Mar. 1, 1989, Ser. No. 317,123
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1977, 7707546[U]
Int. Cl.[5] G01N 21/59
U.S. Cl. 356—427 **6 Claims**



1. A blood coagulation time measuring device, comprising a container, channel means extending into said container for forming a measuring channel for supporting a measuring vessel within said container, stirrer drive means in the region of said channel means for rotating a stirring rod placed inside the measuring vessel, a light detector assembly in said container including a light source and a photo-electric cell for determining the degree of coagulum formation in the measuring vessel wherein a light beam is transmitted from said light source through the measuring vessel in said measuring channel and onto said photo-electric cell which produces a corresponding output, light balancing means coupled to said light source and said photo-electric cell for adjusting the brightness of the light beam from said light source in corresponding relationship to the level of light received by said photo-electric cell wherein said brightness corresponds to the turbidity of liquid in the measuring vessel, display means for indicating blood coagulation time, and control switch means coupled to said light balancing means for controlling said stirrer drive means and said

display means in response to operation of said light balancing means.

4,964,729
EXTRUDING DEVICE
Heinrich Holzer, Niederglatt, Switzerland, and Hans-Dieter Wagner, Eggingen, Fed. Rep. of Germany, assignors to RCM Rubber Consulting & Machinery, Hori, Switzerland
Filed Jun. 9, 1989, Ser. No. 364,800
Claims priority, application Switzerland, Jun. 10, 1988, 2224/88
Int. Cl.[5] B01F 7/08; B29B 1/06
U.S. Cl. 366—75 10 Claims

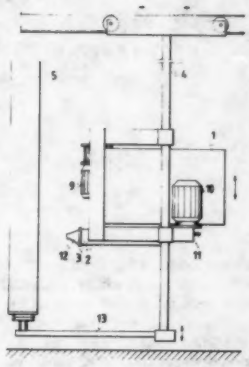


1. Extruding device comprising a casing, a passage through the casing for a flowable mass, the passage having an outlet, and an extruding helix in the passage for urging the flowable mass in the passage towards the passage outlet, a restraining diaphragm placed alongside the helix in the passage, the diaphragm having an adjustable size throughput area through which the flowable mass flows, means for selectively adjusting the size of the throughput area for controlling the flow of the flowable mass, and a degassing section downstream of the diaphragm.

4,964,730
PLASTICATING EXTRUDER SCREW
Bernard G. Alzner, 41 E. North Ave., Lake Forest, Ill. 60045, and Desider G. Csongor, 19 Bennet St., Manchester, Mass. 01944
Continuation of Ser. No. 897,987, Aug. 19, 1986, abandoned. This application Jun. 24, 1988, Ser. No. 212,163
Int. Cl.[5] B29B 7/40
U.S. Cl. 366—81 14 Claims

1. An extruder plasticating screw for processing material input at a single input comprised of two or more parallel channels in a multichannelled section, each channel receiving material from the single input, each channel defined by parallel flights having the same outer diameter extending through a substantial portion of a transition zone, the channels being of different independent transition zone configurations, each channel having an increase in root diameter, the increases in root diameter of the channels being different in each channel, the material output from the channels being combined and mixed.

4,964,731
SHOTCRETE GUN
Olli Virtanen, Parainen, Finland, assignor to Oy Lohja AB, Finland
Filed May 3, 1988, Ser. No. 189,752
Claims priority, application Finland, May 21, 1987, 872246
Int. Cl.[5] B01F 13/02
U.S. Cl. 366—11 2 Claims



1. A shotcrete gun assembly for applying a coating of fresh concrete onto a target, said shotcrete gun assembly comprising:

a shotcrete gun, said shotcrete gun including a cylindrical pipe having a first end, a second end, a side wall, and a longitudinal axis; a worm screw within said cylindrical pipe, said worm screw being rotatable about a tube aligned with said longitudinal axis of said cylindrical pipe and extending at least from said first end o said second end thereof, said worm screw having an axis in common with said longitudinal axis of said cylindrical pipe, said tube serving as a conduit for compressed air through said cylindrical pipe from said first end to said second end thereof; a first opening through said side wall of said cylindrical pipe for the introduction of said concrete into said cylindrical pipe; a nozzle at said second end of said cylindrical pipe, said nozzle having an orifice through which said compressed air expels said concrete toward said target; means for supplying compressed air to said tube; and means for rotating said worm screw;

a frame, said shotcrete gun being mounted on said frame with said nozzle of said shotcrete gun being oriented toward said target; and

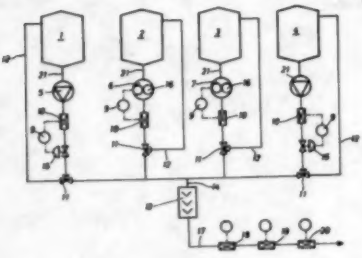
a shotcrete container mounted on said frame, said shotcrete container having an opening through which said concrete moves into said first opening through said side wall of said cylindrical pipe of said shotcrete gun.

4,964,732
METHOD FOR CONTINUOUSLY PRODUCING A FLOWABLE MIXTURE
Angelo Cadeo, Fichtenweg 24, 4852 Rothrist, and Reudi Zellweger, Zofingen, both of Switzerland, assignors to Miteco AG, Zofingen and Angelo Cadeo, Rothrist, both of, Switzerland
Filed Mar. 17, 1989, Ser. No. 325,385
Claims priority, application Switzerland, Mar. 22, 1988, 1086/88
Int. Cl.[5] B01F 15/02
U.S. Cl. 366—159 2 Claims

1. A method of continuously producing a flowable mixture composed of at least two components, which components are

individually fed from a respective storage tank and thereafter intermixed to produce a final product, comprising the steps

of measuring the actual value of the mass flow of each separate component fed from its respective storage tank and of comparing said actual value with a respective rated value;



of feeding all components fed from their respective storage tank in a closed loop individually back to their respective storage tank until the actual value of every single mass flow corresponds to its rated value; and

of uniting the individual components and of intermixing same as soon as every individual actual value corresponds to its respective rated value.

4,964,733

METHOD OF AND MEANS FOR HYDRODYNAMIC MIXING

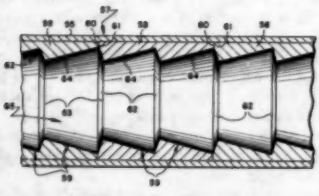
Borje Fredriksson, Dalton, Mass., and Jeffery L. Chamberlin, Lebanon Springs, N.Y., assignors to Beloit Corporation, Beloit, Wis.

Division of Ser. No. 898,475, Aug. 20, 1986, Pat. No. 4,861,165. This application Jul. 27, 1989, Ser. No. 386,743

The portion of the term of this patent subsequent to Aug. 29, 2006, has been disclaimed.

Int. Cl.[5] **B01F** *5/06, 3/04;* **B01D** *43/00;* **B03D** *1/02*

U.S. Cl. 366—336 **6 Claims**



1. Apparatus for attaining an intimate mixture of a plurality of fluent substances in a continuous flow-through passage having an entry end and a discharge end, comprising:

means for combining said plurality of fluent substances at said entry end in a continuously flowing stream filling said flow-through passage under substantial hydrodynamic pressure;

means for subjecting said stream in said passage to substantially continuous turbulence and dispersion with mixing effect, and comprising a series of immediately adjacent alternating radially inwardly tapering relatively short conical turbulence surfaces and radially outwardly flaring relatively longer generally conical turbulence surfaces;

means for effecting abrupt transition of the stream from each of said surfaces to the next of said surfaces throughout the entire length of said series;

said surfaces and said abrupt transition means cooperating for attaining continuous and progressively thorough dispersion and mixing of said substances in the continuously flowing stream from said entry end to said discharge end of said passage; and

said discharge end being arranged for discharging the treated stream to receiving means.

4,964,734

MOISTURE CONTENT MEASURING SYSTEM

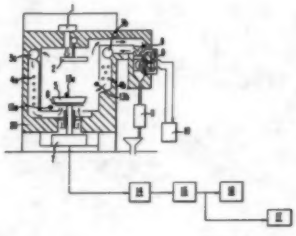
Hiroshi Yoshida, Ichinomiya; Takeki Noguchi, Aichi; Masahiko Ichikawa, Okazaki; Takemi Nakane; Kyoji Kubo, both of Hiroshima, and Kenichiro Kinoshita, Tokyo, all of Japan, assignors to Chubu Electric Power Company Inc., Aichi and Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed May 5, 1989, Ser. No. 347,903

Claims priority, application Japan, May 10, 1988, 63-111535

Int. Cl.[5] **G01N** *25/56*

U.S. Cl. 374—14 **6 Claims**



1. A moisture content measuring system for measuring the moisture content of a sample, said system comprising:

a sample container for holding a sample;

a weighing instrument, having a rotatable turntable adapted to support said sample container, for issuing analogue signals indicative of the weight of a sample held in said sample container while supported on said turntable;

an A/D converter operatively connected to said weighing instrument for receiving the analogue signals issued thereby and converting the same to corresponding digital signals;

a calculator operatively connected to said A/D converter for receiving the digital signals, for calculating the moisture content of the sample on the basis of the digital signals, and for issuing signals representative of the calculation;

an indicator operatively connected to said calculator for receiving the signals issued by said calculator and for indicating results of moisture detection obtained by the signals so received;

heating means including a hot gas generator for generating hot gas and for heating the sample by forcing the hot gas past the sample resulting in moisture evaporating from the heated sample into such hot gas; and

dehumidifying means for removing moisture evaporated from the heated sample.

4,964,735

APPARATUS FOR INDICATING THE POWER AND POSITION OF A LASER BEAM

Michael W. Sasnett, Los Altos; Ronald Paltich, Auburn, and Edward L. Aurich, Colfax, all of Calif., assignors to Coherent, Inc., Palo Alto, Calif.

Filed Apr. 7, 1989, Ser. No. 335,000

Int. Cl.[5] **G01K** *17/00*

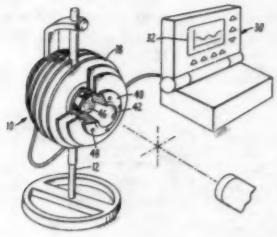
U.S. Cl. 374—32 **28 Claims**

1. An apparatus for providing information about the position of a laser beam comprising:

a heat absorbing body having a uniform target area within which the laser beam is directed; and

a plurality of thermocouples formed on said body and di-

vided into at least two groups with each group having at least two thermocouples, said thermocouples for generating a voltage proportional to the heat flow in the body absorbed from the laser beam such that the summation of the voltages of each individual group of thermocouples



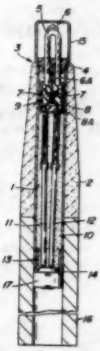
will be proportional to the total power of the beam and whereby a comparison of the voltages generated by each individual group of thermocouples will provide information about the position of the laser beam with respect to the orientation of said groups.

4,964,736

IMMERSION MEASURING PROBE FOR USE IN MOLTEN METALS

Omer Cure, Diepenbeek, and Theo P. C. Bollen, Genk, both of Belgium, assignors to Electro-Nite Co., Philadelphia, Pa.

Continuation of Ser. No. 780,707, Sep. 26, 1985, abandoned, which is a continuation of Ser. No. 513,532, Jul. 13, 1983, abandoned. This application Mar. 27, 1989, Ser. No. 331,091
Claims priority, application Belgium, Oct. 8, 1982, 59866
Int. Cl.[5] G01K *1/12*
U.S. Cl. 374—140 **7 Claims**



1. An immersion measuring probe for measurements in a molten metal bath comprising:

an elongated hollow electrically conductive tube, said tube having an immersion end and a connector end;

a measuring head closing the internal portion of said immersion end of said tube, said measuring head having

a non-conductive support plug,

a thermocouple element supported by said plug and having one end projecting from said immersion end of said tube and an electrically conductive portion extending into said tube beyond said plug,

an electro-chemical cell extending through said plug having one end adjacent to said projecting end of the thermocouple element and an electronically conductive portion extending into said tube beyond said plug;

a gas impermeable enclosure receiving the electrically conductive portions of said thermocouple and said cell, said enclosure being closely adjacent to said measuring head within said tube;

electrical conductors extending from said enclosure to said connector end of said tube;

an electrical connector closing said connector end of said tube and providing electrical connections for said thermocouple, said cell and said tube;

said tube between said plug and said connector being filled with a heat insulating particulate material which is loosely packed such that it is gas permeable;

a sheathing surrounding a major portion of the length of said tube, said sheathing being made of a fireproof, refractory heat resistant material attached to the exterior of said tube, the outer surface of said sheathing being tapered towards the immersion end of said tube such that a minimum thickness of said sheathing is directly adjacent to and exposing said immersion end of said tube for minimizing trapped gases adjacent the measuring head when immersed into the metal bath, the opposite end of said sheathing from said tapered end forming a shoulder adjacent to said connector end of said tube; and

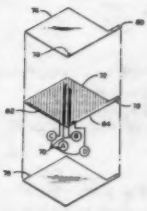
an elongated hollow support for receiving said shoulder of said sheathing in an abutting relationship such that the end of said tube is inserted into said support and said outer diameter of said sheathing and said support are substantially the same at said shoulder.

4,964,737

REMOVABLE THERMOCOUPLE TEMPLATE FOR MONITORING TEMPERATURE OF MULTICHIP MODULES

Don L. Baker, Johnson City; Glenn D. Gilda, Endicott; Terrence A. Quinn, Poughkeepsie, and Hussain Shaukatullah, Endwell, all of N.Y., assignors to IBM, Armonk, N.Y.

Filed Mar. 17, 1989, Ser. No. 324,929
Int. Cl.[5] G01K *7/02*
U.S. Cl. 374—179 **21 Claims**



1. A testing unit for monitoring the operating temperatures of electronic components including:

a flat sheet of insulator material adapted for mounting between an electronic component such as a multichip module and an adjacent component, with said multichip module having a plurality of pins extending from one side of the module and wherein said flat sheet includes a plurality of apertures matching the pattern of said pins for removable mounting of said flat sheet over said pins on the pin side of the module, said flat sheet being sized to be mounted over only a portion of said pins;

at least one thermocouple positioned at a predetermined location on a surface of said flat sheet;

wire means electrically connected to said thermocouple for carrying data to a display and/or recording device; and

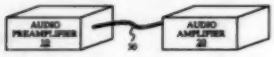
attachment means connected to said thermocouple and said flat sheet for holding said thermocouple in its predetermined location.

4,964,738

ELECTRICAL CONDUCTOR OF HIGH MAGNETIC PERMEABILITY MATERIAL FOR AUDIO CIRCUITS

David S. Lindsay, 585 Manet Ter., Sunnyvale, Calif. 94087, and Calvin J. Geyer, 3833 Park Blvd., #20, Palo Alto, Calif. 94306

Filed Nov. 14, 1988, Ser. No. 271,202
Int. Cl.[5] H04B 3/00
U.S. Cl. 381—97 5 Claims



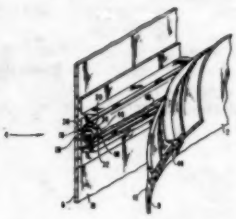
1. An audio circuit for processing audio frequencies, wherein electrical conductors connecting various components comprising the audio circuit are formed of a conductive material of magnetic permeability greater than 1,000.

4,964,739

FLEXIBLE CONTAINER HAVING TAMPER EVIDENT CLOSURE

Mark E. Branson, Shelbyville, and Paul F. Edelman, Greenwood, both of Ind., assignors to KCL Corp., Shelbyville, Ind.

Filed Apr. 6, 1989, Ser. No. 334,697
Int. Cl.[5] B65D 33/34
U.S. Cl. 383—5 17 Claims



1. A tamper evident bag comprising two opposing wall panels and a tamper evident frangible fastener profile assembly attached to the inside surface of said walls proximate to the top portion thereof, said tamper evident frangible fastener profile assembly comprising:

a first lockable fastener profile element being formed of plastic and having a web portion with a rib extending lengthwise therealong, said rib comprising a neck portion formed on said web and with a head thereon with a tip at the distal end of said head and at least one side barb projecting outwardly from the side of said head;

a second lockable fastener profile element being formed of plastic and having a web portion having a groove element extending lengthwise therealong, said groove element comprising a pair of jaws spaced to form a groove receptacle to receive said head therebetween and with an entrance opening leading into said groove receptacle and the groove receptacle shaped to correspond to the shape of said head, whereby said head is received by said groove receptacle thereby forming a locked interconnection, said locked interconnection being permanent; and

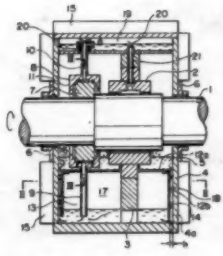
a bridge portion connecting said groove element to the web of said second lockable fastener profile element, said bridge being frangible whereby said bridge will snap or break when the groove element and web portion of said second element are pulled apart, whereby opening of said bag is effective to sever said bridge thereby visually indicating the opened condition of said bag.

4,964,740

BEARING APPARATUS FOR A ROTARY MACHINE HAVING A HORIZONTAL ROTATING SHAFT

Masaaki Nakano, Hitachi; Tomoaki Inoue, Mito; Kazuhiko Kawaike, Katsuta; Yuji Yamamoto, and Motoyuki Ishikawa, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 22, 1989, Ser. No. 326,978
Claims priority, application Japan, Mar. 25, 1988, 63-69489
Int. Cl.[5] F16C 33/66, 33/10
U.S. Cl. 384—313 29 Claims



1. A bearing apparatus for a rotary machine having a horizontal rotating shaft comprising:

a bearing for supporting said horizontal rotating shaft;

a bearing box for supporting said bearing therein;

a lubricating oil tank formed in the lower portion of said bearing box for storing lubricating oil and comprising a recovery chamber disposed in the upper portion of said bearing box for recovering the lubricating oil discharged from said bearing and a lubricating oil supplying chamber disposed beneath said recovery chamber for storing the lubricating oil to be supplied to said bearing;

a lubricating oil supply device for picking up the lubricating oil in said lubricating oil supplying chamber to supply it to said bearing; and

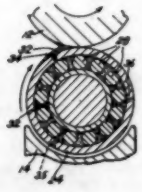
a first lubricating oil passage formed by a gap created by at least of a part of a side wall of said bearing box and a first oil guide member which stands adjacent to said at least a part of said side wall and communicating said recovery chamber with said lubricating oil supplying chamber.

4,964,741

ROLLER ASSEMBLY

Earl Gaerte, 601 Monroe, Rochester, Ind. 46975

Filed Feb. 12, 1990, Ser. No. 478,555
Int. Cl.[5] F16C 33/66
U.S. Cl. 384—475 5 Claims



1. In a roller assembly including a housing carrying a stationary axle, a roller rotatably positioned about said axle, and bearing means positioned between said axle and said roller, said bearing means for facilitating rotation of said roller about said axle, the improvement wherein said roller has a hole drilled therethrough communicating with said bearing means, said

hole constituting conduit means for allow circulation of lubricant to said bearing means.

4,964,742

BALL BEARING

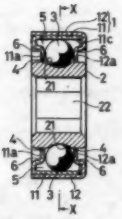
Akiyobu Kagawa; Teruichi Inoue, both of Kagawa; Masaru Kametani, Tokushima, and Koji Nakamura, Takamatsu, all of Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Aug. 24, 1989, Ser. No. 398,573

Claims priority, application Japan, Sep. 5, 1988, 63-116544[U]; Feb. 10, 1989, 64-15123

Int. Cl.[5] F16C *33/58, 33/62*

U.S. Cl. 384—515 4 Claims



1. A ball bearing comprising:

an outer ring including (i) an inner cylindrical body made of a steel sheet of which one peripheral edge is bent inwardly in a radial direction to form a round corner and a first flange with a radial inwardly directed part, and (ii) an outer cylindrical body of which one peripheral edge is bent inwardly in a radial direction to form a second flange with a radial inwardly directed part, said outer cylindrical body having a portion press-fitted to said inner cylindrical body;

an inner ring made of a forging material provided on its outer circumferential surface thereof with a raceway groove. said inner ring having a shaft hole of which section is circular or polygonal according to a section configuration of a shaft to be inserted into said shaft hole,

balls loaded in an annular space between said outer ring and said inner ring;

said first and second flanges of said outer ring being drawn in a rotational axis direction toward said balls in order to prevent looseness of said balls, said first and second flanges including parts in a vicinity of a Pitch Circle Diameter of said balls which are bent and drawn toward said balls parallel with a rotational axis of the ball bearing with radially inward-directed parts of said flanges extending radially inwardly from the drawn portions and at right angles to said rotational axis of the ball bearing, with inner lateral surfaces of said radially inward-directed parts being flat corresponding to the Pitch Circle Diameter of said balls thus serving as ball guiding members; and

gaps formed between said outer circumferential surface of said inner ring and the ends of said first and second flanges of said outer ring being small so that said ball bearing has a sealing structure.

4,964,743

RECEPTACLE FOR A HOLDER FOR A RIBBON FOR USE IN TYPEWRITERS OR SIMILAR MACHINES

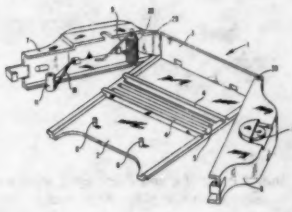
Johannes Haftmann, Schwabach, and Werner Haczek, Furth, both of Fed. Rep. of Germany, assignors to TA Triumph-Adler Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Dec. 6, 1988, Ser. No. 280,485

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1987, 3741360

Int. Cl.[5] B41J *32/00, 33/24, 33/52*

U.S. Cl. 400—208.1 7 Claims



1. A receptacle for a holder of a ribbon for typewriters or similar machines, comprising:

a base plate; and

pivotable retaining elements disposed on said base plate for surrounding the holder of the ribbon in a shell-like manner in an operating position, said retaining elements having a drive element, a braking element and tensioning elements for the ribbon.

4,964,744

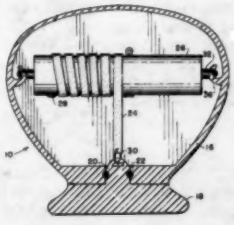
LOTION APPLICATOR WITH REWINDING SPOOL

Frank W. Whitear, 21071 Gary Dr., #201, Hayward, Calif. 94546

Filed Sep. 25, 1989, Ser. No. 411,648

Int. Cl.[5] A45D *34/00*

U.S. Cl. 401—6 4 Claims



1. A lotion applicator for the storage and dispensing of thick fluid lotion, said applicator comprising:

an ornamental fluid storage bottle having a circular opening on a longitudinal axis into said bottle;

a stopper for sealing said circular opening, said stopper being on a handle forming a part of the ornamental design of said bottle;

a spring biased, self-rewinding spool secured within said bottle, said spool being rotatable about a lateral axis normal to said longitudinal axis of said circular opening; and

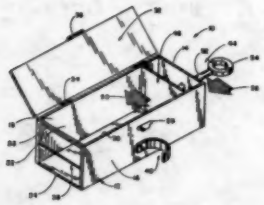
an elongated, ribbon-like, maturable, dispensing wick wound on said spool, said wick having a first end attached to said spool and a second end attached to said stopper.

4,964,745

CONTAINER FOR STORING AND DISPENSING SEMI-SOFT STICKLIKE FOOD PRODUCTS

Rosemary Deitz, 522 - 4th Ave., Sydney, Ohio 45385

Filed Aug. 3, 1989, Ser. No. 389,262
Int. Cl.[5] A47G *19/18, 19/26*
U.S. Cl. 401—131 **4 Claims**



1. A container for storing and dispensing semi-soft sticklike food products, such as butter, oleomargarine, or the like, comprising:

(A) a case having
  (1) an end wall,
  (2) two side walls connected to said end wall,
  (3) a bottom wall connected to said end and side walls,
  (4) an open top,
  (5) a latch-receiving recess defined in one of said two side walls, and
  (6) an open end;

(B) a door pivotally mounted on a second one of said side walls by a hinge means and including a latch;

(C) a wire mounted on said side walls and extending across said open end;

(D) a U-shaped finger grip mounted on each side wall and being concave with respect to said open end;

(E) a plunger mechanism which includes
  (1) a pusher plate slidably mounted inside said case to move from said end wall toward said open end,
  (2) a pusher arm rotatably mounted at one end thereof to said pusher plate and extending through said end wall, and
  (3) a ring mounted on another end of said pusher arm; and

(F) a stand which includes
  (1) a base,
  (2) stand walls attached to said base and extending away from said base to converge towards each other, each end wall having an upper edge,
  (3) an upper rim defined by said wall upper edges, and
  (4) a support platform connected to said stand walls at a location spaced from said rim to define with said stand walls a case-receiving chamber.

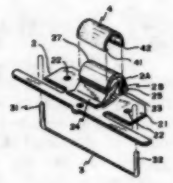
4,964,746

ELASTIC CLIP WITH POSITIONING MEANS FOR POSITIONING OF PERFORATIONS

Li-Hsii Huang, No. 3, Lane 194, Chang Shui Rd., Changhua, Taiwan

Filed Mar. 29, 1989, Ser. No. 330,311
Int. Cl.[5] B42F *13/00*
U.S. Cl. 402—25 **3 Claims**

1. An elastic clip with positioning means for positioning of perforations including a bottom block with an U-shaped frame bar movably mounted thereon, said U-shaped frame bar having two positioning rods, said bottom block having a "I" shaped configuration with the rear portion made slightly narrower than the space betwen said two positioning rods of said U-shaped frame bar so as to allow said U-shaped frame bar be set in a rest position with said two positioning rods disposed by both lateral sides of the rear portion of said bottom block; two piercing holes being made on the rear portion of said bottom block for fixation of said bottom lock onto a file by means of fastening means; a bridge frame being extended from the rear portion of said bottom block to project upward and to bend forward by means of a folding line, said bridge frame having a tongue plate at the front to provide a clamping effect against said bottom block by means of the elastic force of said bridge frame; an arch frame being set on the top of said bridge frame with both ends integrally connected thereto by means of two ribs and with two folding lines respectively arranged between said two ribs and said arch frame; and characterized in that said U-shaped frame bar may be set in a rest position with said two



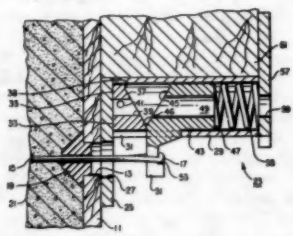
positioning rods horizontally set by both lateral sides of the rear portion of said bottom block, and said tongue plate being forced by the elastic force of said arch frame to clamp against said bottom block for retaining paper document; or said U-shaped frame bar may be erected to let said two positioning rods be respectively penetrating through the two punched holes of a paper that has been punched, and after punched paper is well positioned by means of said two positioning rods, said tongue plate being pressed downward to clamp the paper.

4,964,747

CONCRETE FORM BRACKET

Michael A. Vinson, Rte. 1, Box 183, Milsap, Tex. 76066

Filed Jan. 9, 1990, Ser. No. 462,744
Int. Cl.[5] F16B *1/00*; F16D *1/00*
U.S. Cl. 403—24 **9 Claims**



1. In a wall form for forming a concrete wall, the wall form being of a type having spaced apart form panels with a plurality of holes, a tie extending through each of the holes to retain the form panels in position, an improved apparatus for tightening the ties, comprising in combination:

a cam assembly having an inner member and an outer member axially aligned with the inner member, the cam assembly adapted to bear against one of the panels;

tapered abutting wedge surfaces on the inner and outer members;

a lug on the outer member for receiving an end of the tie and movable linearly therewith; and

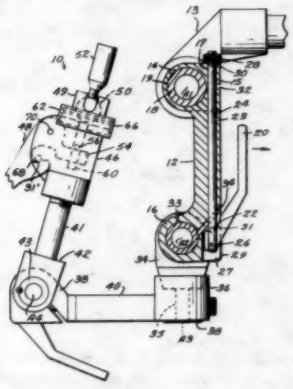
rotating means for rotating one of the members relative to the other member to cause one of the wedge surfaces to rotate relative to the other wedge surface, for moving the lug from an inner position to an outer position to tighten the tie.

4,964,748

POSITIONING DEVICE

Joseph T. McFadden, 513 Mowbray Arch, Norfolk, Va. 23507

Filed Jun. 2, 1989, Ser. No. 360,306
Int. Cl.[5] F16B 7/10
U.S. Cl. 403—55 **7 Claims**



1. A device for positioning of an object relative to a base comprising:

first, second and third arm means,

said first and second arm means each having first and second opposite ends, each said end of a said respective first and second arm means having clamp means movable between a locked and unlocked position, said first and second arm means each further including movable actuating means for substantially simultaneously moving each said clamp means of said respective first and second arm means between said locked and unlocked positions in response to movement of said respective actuating means between an actuated and a deactuated position,

a first bracket means including shaft means releasably and rotatably engaged by said clamp means of said second end of said first arm means, said first bracket means further including pin means releasably engaged and retained by said clamp means of said first end of said second arm means so that said second arm means is rotatable about said pin means when said respective clamp means of said second arm means is in an unlocked position,

a second bracket means including another shaft means releasably and rotatably engaged by said clamp means of said second end of said second arm means, said third arm means having a first end rigidly mounted on said second bracket means so that said third arm means is movable therewith, said third arm means having a second end opposite said first end thereof provided with a movable mounting member and locking means for locking said mounting member in a selected position relative to said third arm means.

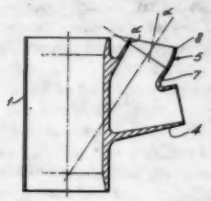
4,964,749

JOINT PIECE

Tapio Saari, Tampere, Finland, assignor to Rauma Repola OY, Finland

Filed Apr. 21, 1989, Ser. No. 341,934
Claims priority, application Finland, Apr. 29, 1988, 882027
Int. Cl.[5] F16D 1/00
U.S. Cl. 403—169 **7 Claims**

1. A joint piece cast out of steel, comprising a frame tube and at least one branch on an outer face of said frame tube, said branch having a straight tubular frame portion and a tube portion connected to an end of said straight tubular frame portion opposite said frame tube, said tube portion curving from said straight tubular portion, said tube portion when cut



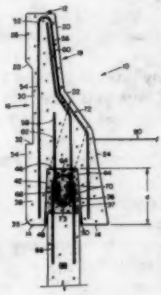
at a desired angle forming an aligned connecting head for joining to a tube at the desired angle.

4,964,750

TRAFFIC BARRIER AND METHOD OF CONSTRUCTION

Randall House, and Jesse Covarrubias, both of San Antonio, Tex., assignors to Randall House, San Antonio, Tex.

Filed May 4, 1989, Ser. No. 347,482
Int. Cl.[5] E01F 13/00
U.S. Cl. 404—6 **8 Claims**



1. A precast concrete traffic barrier for use as a safety device to resist the unintended passage of a vehicle over a wall structure, comprising:

A. a plurality of concrete reinforcing rods reinforcing said precast concrete traffic barrier;

B. a bottom surface having a longitudinally extending channel, said longitudinally extending channel having an outer lip, inner lips, and bottom surface;

1. said inner lips and outer lip partially supporting said precast concrete traffic barrier's weight;

2. said outer lip located on the opposite side of said longitudinally extending channel from said inner lips;

3. said inner lips are located in from each end of said precast concrete traffic barrier so as to minimize the possibility of said inner lips being damaged during transportation and construction;

C. said outer lip having:

1. a bottom surface;

2. an inner vertical surface extending down the outer edge of said wall structure;

3. an inner horizontal surface for mounting said traffic barrier onto said wall structure;

D. attachment means to couple said wall structure and precast concrete traffic barrier, comprising:

1. a plurality of first U-shaped coupling members extending from said precast concrete traffic barrier to within said longitudinal channel;

2. a plurality of second U-shaped coupling members ex-

tending from said wall structure to within said longitudinal channel;

3. an oval structure within said longitudinal channel formed by said first U-shaped coupling member and said second U-shaped coupling member;

4. a plurality of interconnected reinforcing rods positioned in a coupling relationship with said plurality of first U-shaped coupling members and said plurality of second U-shaped coupling members; and

5. concrete being placed within said longitudinally extending channel encasing said plurality of first U-shaped coupling members, said plurality of second U-shaped coupling members, and said locking member wherein said inner vertical surface of said precast concrete traffic barrier creates a camming action from said precast concrete traffic barrier to said wall structure to resist overturning forces on said precast concrete traffic barrier when said precast concrete traffic barrier is struck by a vehicle.

7. A method of constructing a traffic barrier on a top edge of a wall structure having a traffic surface thereon, comprising the steps of:

said traffic barrier comprised of:

a side facing the traffic surface with a cross-sectional profile for redirecting an incident vehicle toward the traffic surface;

a side facing away from said side facing the traffic surface;

a bottom surface having a longitudinally extending channel;

said longitudinally extending channel having an outer lip, inner lips, and bottom surface;

said inner lips and outer lip are on opposite sides of said longitudinally extending channel;

said inner lips and outer lip partially supporting the traffic barrier's weight;

said outer lip comprising;

a bottom surface;

an inner vertical surface extending down the outer edge of said wall structure;

an inner horizontal surface for mounting said traffic barrier onto said wall structure; and

a sidewall of said longitudinally extending channel; and

attachment means to couple said wall suructure and said traffic barrier, comprising;

a first U-shaped coupling member extending from said traffic barrier to within said longitudinal channel;

a second U-shaped coupling member extending from said wall structure to within said longitudinal structure;

an oval structure within said longitudinal channel formed by said first U-shaped coupling member and said second U-shaped coupling member;

grading of the roadway substructure level with said top edge of said wall structure;

positioning said traffic barrier over said top edge of said wall structure so that said longitudinally extending channel of said traffic barrier is aligned with said top edge;

placing sealing material on said top edge of said wall structure and on top of said roadway substructure adjacent to said wall structure;

lowering of said traffic barrier so that said inner horizontal surface and said inner lips support said traffic barrier;

coupling said traffic barrier and said wall structure by inserting a locking member through said oval structure; and

placing concrete within said longitudinally extending channel encasing said plurality of first U-shaped coupling manner, said plurality of second U-shaped coupling member, and said locking member.

4,964,751

DUCKBOARD

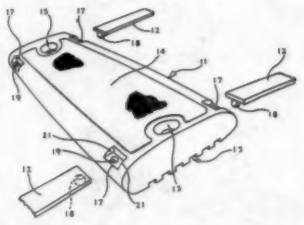
Christopher C. Rope, and Pamela A. Rope, both of Watton, England, assignors to Handbury Limited, Norfold, England

Filed Apr. 8, 1988, Ser. No. 179,082

Claims priority, application United Kingdom, Apr. 9, 1987, 8708539

Int. Cl.[5] E01C *9/08*

U.S. Cl. 404—35 **15 Claims**



1. A duckboard comprising

a plurality of elongate tread members substantially rectangular in plan, and including a ground engaging surface and a non-ground engaging surface,

said tread members each having connection means adjacent the ends of opposing side edges of the non-ground engaging surfaces,

a plurality of connecting strips for connecting pairs of tread members, said strips being flexible along their thin dimension and rigid along their width,

means on the ends of each strip for removably securing the same to said connection means on adjacent tread members to hold a plurality of said tread members in parallel fixed relation and spaced apart by the length of said strips and with the ends of said tread members being aligned,

whereby, in use, the treads rest on a surface on which the board is placed with the non-ground engaging surfaces of the treads maintained substantially parallel and uniformly spaced by said strips,

said duckboard having sufficient flexibility to be rolled end-to-end, being light enough to be hand carried, and the length of the duckboard being readily extended or shortened in situ by the addition or removal of tread members and connecting strips.

4,964,752

METHOD AND APPARATUS USING BITUMINOUS SANDSTONE FOR PAVEMENT REPAIR

Myrle E. Astrope, 220 North 1300 East, and Norman P. Bushman, 1213 East 50 North, both of Pleasant Grove, Utah 84062

Division of Ser. No. 146,296, Jan. 20, 1988. This application Aug. 21, 1989, Ser. No. 396,430

Int. Cl.[5] E01C *9/12*

U.S. Cl. 404—92 **13 Claims**

1. Apparatus for preparing and applying a slurry of bitumen sandstone and water to a surface opening in paving material, comprising:

a mobile base having a top support surface;

a first enclosed chamber attached at the top surface for containing water;

a first chamber inlet;

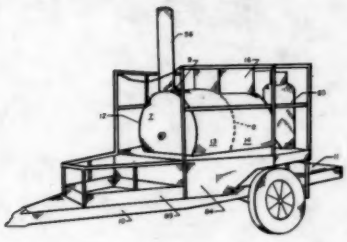
a first chamber outlet including a valved fluid control means for controlling released fluid from the first chamber, said outlet being coupled to the first chamber for releasing heated water contained therein;

fluid heating means within the first chamber for heating water contents to a temperature greater than 150 Fahrenheit;

a second enclosed chamber attached to the top support

surface for receiving bitumen sandstone and water to be mixed into a slurry composition;

fluid flow means coupled between and interconnecting the first and second chambers for transporting water from the first chamber outlet to the second chamber;



a second chamber opening for introducing the bitumen sandstone therein;

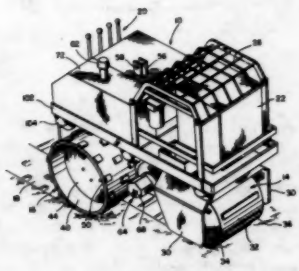
mixing means positioned within the second chamber for continuously agitating and liquefying the water-sandstone mixture into a slurry within the second chamber in a controlled manner.

4,964,753

THREE ROLL COMPACTOR

Michael A. Ciminelli, Webster; Jack Buck, Hemlock; Charles G. Weaver, Farmington, and Darryle E. Fowler, Victor, all of N.Y., assignors to Stone Construction Equipment, Inc., Honeoye, N.Y.

Filed Jun. 17, 1988, Ser. No. 207,854
Int. Cl.[5] E01C *19/26*
U.S. Cl. 404—122 **9 Claims**



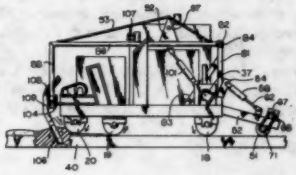
1. A compactor comprising a frame, a front roller rotatably supported below the frame in contact with soil to be compacted, a pair of rear rollers rotatably mounted from the frame for engagement with soil to be compacted, said rear rollers being spaced behind the front roller and said rear rollers being spaced transversely and in alignment with each other, a vibration device mounted on the frame between the front roller and rear rollers, means drivingly connected to each of the rollers to independently drive each of the rollers in a forward and reverse direction and drive means for the vibration device operative independently of the roller drive means.

4,964,754

CONCRETE SCREEDING MACHINE

James D. Garner, 2704 Boars Head Rd., and John M. Hinnant, 3973 Belair Rd., both of Augusta, Ga. 30907

Continuation-in-part of Ser. No. 356,260, May 24, 1989, Pat. No. 4,913,584. This application Aug. 24, 1989, Ser. No. 398,254
Int. Cl.[5] E01C *19/29*
U.S. Cl. 404—123 **1 Claim**



1. A screeding machine for screeding paving material comprising, in combination, a frame member having a front and a rear portion,

first and second drive rollers mounted to said frame and positioned with their lower surfaces tangential to a reference support plane,

a screed roller mounted on said frame in front of said drive rollers with its periphery above said reference support plane,

a finishing roller mounted to a rear portion of the frame,

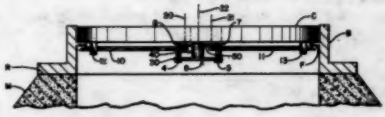
and paving material agitating means positioned at the front portion of said frame in front of said screed roller, and means for moving said paving material agitating means between a raised position above said reference plane and a lowered position below said reference plane.

4,964,755

MANHOLE COVER LOCK APPARATUS

William F. Lewis, and Bert R. Moore, both of Golden, Colo., assignors to Lew-Mor, Inc., Golden, Colo.

Filed Apr. 18, 1989, Ser. No. 339,756
Int. Cl.[5] F16K *35/10*; E02D *29/14*
U.S. Cl. 404—25 **26 Claims**



1. Lock apparatus for locking a cover onto a seating base wherein the cover is a disk-shaped body with a top surface, a bottom surface, and a peripheral edge and the seating base has an annular flange adapted to support the cover by bearing on the bottom surface of the cover adjacent its peripheral edge, said lock apparatus comprising:

latch means attached to the bottom surface of the cover for realeasably engaging said annular flange in a manner that prevents movement of said cover away from said flange when said lock means is engaged;

latch actuator means connected to said latch means for engaging and disengaging said latch means, said latch actuator including a rotatable member that actuates said latch means by rotational movement;

lock means associated with said latch actuator means in such a manner that said lock means releasably secures said rotatable member against rotation when said latch means is engaged with said flange, said lock means being configured to require movement of said rotational member in a direction parallel to its axis of rotation before it is rotatable in an angular direction to disengage said latch means; and

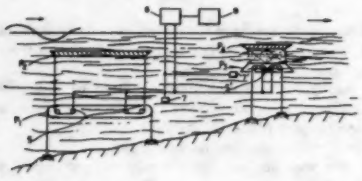
removable key means for moving said rotatable member in said axial direction and for rotating said rotatable member.

4,964,756

TIDE ATTENUATOR

Pierre Guevel, Chateauneuf/Grasse; Eric Landel, Antibes, both of France; Jean-Michel Manzone, Monaco, Monaco, and René Bouchet, Eze, France, assignors to Principia Recherche Developement S.A., France

Continuation of Ser. No. 799,360, Nov. 18, 1985, abandoned. This application May 4, 1987, Ser. No. 46,528
Claims priority, application France, Jan. 24, 1985, 85 01165
Int. Cl.[5] E02B *3/06*
U.S. Cl. 405—26 **19 Claims**



1. A method of attenuating sea swell at wave periods for protecting coastal and offshore structures of installations, comprising in combination:

anchoring at a site at least one water impervious slab to the sea bottom below a free surface of the sea at a distance selected from the free surface to form a wall of water of a given height between itself and the bottom of the sea,

maintaining said slab at said given height such that said wall responds to sea swell by oscillating horizontally with a to and fro movement generating diffracted waves and generating a system of radiation waves which combines with said diffracted waves downstream from said wall of water to produce a nil to low amplitude resultant;

and selectively adjusting the spacing of said slab from said sea bottom according to characteristics of said site and of said sea swell so as to at least significantly suppress the waves approaching said slab from the sea side.

4,964,757

ECOLOGICAL PANEL FOR OBTAINING IN PARTICULAR BANK DEFENCES BY HINGING IT TO IDENTICAL PANELS

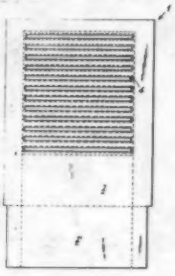
Francesco Goggi, Piazzetta Venco 4, 27045 Casteggio (Pavia), Italy

Filed Aug. 7, 1989, Ser. No. 390,200
Claims priority, application Italy, Sep. 16, 1988, 21984 A/88
Int. Cl.[5] E02B *3/06*
U.S. Cl. 405—30 **3 Claims**

1. Prebabricated panels for preventing erosion of water banks, each said panel being comprised of:

a flat wall (2) having a plurality of horizontal slots (4) , said slots being trapezium-shaped with the minor frontal side intended to face away from the bank and toward the water;

self-fitting, self-locking hinge means (5, 6), said hinge means comprising a male part (5) rigid with one panel and a female part (6) rigid with an adjacent panel, said male part comprising a vertical fixed bar (7) and said female part comprising a fixed element (9) on which a right-angled element (13) is pivoted (12), said fixed element having a wide V aperture (10) designed to receive said bar (7) of the male part, the purpose of said right-angled element (13)



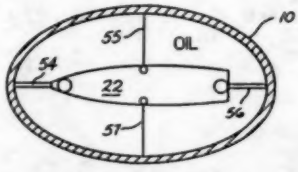
being to automatically lock said bar when said bar is inserted into said V aperture.

4,964,758

FLOATING OIL ENCLOSURE BARRIERS AN DISPENSING MEANS ABOARD AN OIL TANKER FOR DISCHARGING WITHOUT THE AID OF SURFACE VESSELS

Anatol Pekelny, 17649 Tuscan Dr., Granada Hills, Calif. 91344

Filed Oct. 17, 1989, Ser. No. 422,579
Int. Cl.[5] E02B *15/04*
U.S. Cl. 405—66 **15 Claims**



1. The method of controlling oil spills comprising the steps of:

storing in an accessible position about an oil carrying tanker an elongatable, floatable oil encompassing barrier capable of containing oil on the surface of water and having a length great enough to surround the tanker and form an enclosure floating on the water at a predetermined distance away from the tanker,

providing means on the tanker for aid in discharging the barrier from the tanker into the water and forming it into said enclosure configuration,

discharging the barrier to control oil discharged from the tanker by catapulting the barrier from the tanker, and

forming a floating oil containing enclosure about the tanker with said barrier.

13. An oil tanker comprising in combination, a stored quantity of barrier material aboard the tanker capable of forming a floating enclosure about the tanker that retains oil discharged from the tanker, and mechanical discharge catapulting means resident on the tanker for aiding the dispensing of the barrier material from the tanker to form said floating enclosure.

4,964,759

APPARATUS FOR SELECTIVELY ROTATING A TOOL RELATIVE TO THE WALL OF A CONDUIT

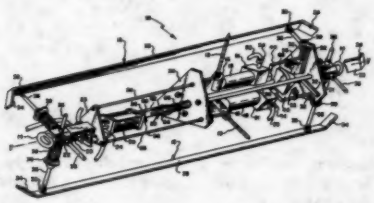
Gerald J. Guzzetta, 11137 North Rd., Perrysburg, N.Y. 14129; David E. Hornberger, Angola, N.Y.; Charles A. Guzzetta, Brant, N.Y., and Larry M. Schadt, East Amherst, N.Y., assignors to Gerald J. Guzzetta, Perrysburg, N.Y.

PCT No. PCT/US87/01287, § 371 Date Jan. 30, 1989, § 102(e) Date Jan. 30, 1989, PCT Pub. No. WO88/09705, PCT Pub. Date Dec. 15, 1988

PCT Filed Jun. 2, 1987, Ser. No. 333,322

Int. Cl.[5] F16L *1/00*; B23B *41/00*

U.S. Cl. 405—154 7 Claims



1. Apparatus for selectively rotating a tool relative to the wall of a conduit, comprising:

a frame adapted to be positioned within said conduit and translated to a desired location therealong;

a chuck rotatably mounted on said frame;

a motor operatively arranged to selectively rotate said chuck at a desired rotational speed;

a tool releasably held in said chuck; and

an actuator mechanism acting between said frame and chuck and selectively operable to cause said tool to move away from said frame to engage said conduit wall, said actuator mechanism including a plate mounted on said frame for movement in a substantially radial direction relative to said conduit wall, wherein said chuck and motor are mounted on said plate, wherein said plate is provided with an inclined surface, and further comprising a member having a cam surface engaging said plate surface, and an actuator acting between said frame and cam member for selectively causing said surfaces to move relative to one another.

4,964,760

DOCK BUMPER GUARD

Thomas J. Hartman, 4763 N. Idlewild, Whitefish Bay, Wis. 53211

Continuation of Ser. No. 264,029, Oct. 28, 1988, abandoned. This application Nov. 22, 1989, Ser. No. 441,192

Int. Cl.[5] E02B *3/26*

U.S. Cl. 405—215 7 Claims

1. A bumper guard for protecting a boat at a dock, comprising, in combination:

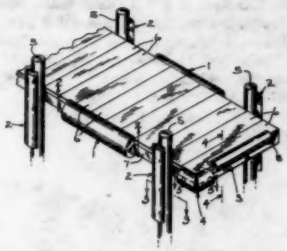
(a) a resilient longitudinally extending body, said body having a dock-engaging surface on one longitudinal side thereof and having a boat-engaging surface on an opposite longitudinal side thereof,

(b) cushioning means disposed between said surfaces for cushioning the impact of a boat coming into contact therewith,

(c) at least one body opening extending through said cushioning means between said surfaces, said opening including:

(1) a first portion having an inner end and having an outer end communicating with said boat-engaging surface, (2) the said inner end of said first portion merging into a second portion communicating between the area of merger with said first portion and said dock-engaging surface, and with said second portion being of smaller diameter than said first portion, (3) a shoulder portion at the area of merger between said first and second portion,

(d) reinforcing means disposed in said body and positioned adjacent the shoulder portion at said area of merger and being retained therein by a surface of said cushioning means opposite said shoulder portion, said reinforcing means having a diameter larger than that of said second portion,



(e) and fastener means disposed in and extending through said opening and said reinforcing means for tighteningly fastening said body to a dock, said fastener means including an enlarged portion engageable with said reinforcing means during said fastening of said body to a dock,

(f) said reinforcing means, during said fastening, forming means to prevent said enlarged portion of said fastener means from pulling through said second portion of said opening.

4,964,761

RETAINING WALL ADAPTED TO BE PROVIDED WITH VEGETATION, COMPRISING OPENINGS SERVING AS A CONCEALED FRAMING FOR CONCRETE

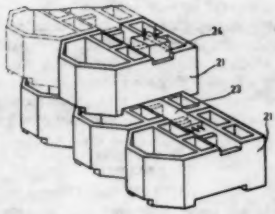
Jean-Louis Rossi, Le Grand Pin de Righi, 25 rue Georges Doublet, 06100 Nice, France

Filed Oct. 2, 1989, Ser. No. 417,249

Claims priority, application France, Sep. 30, 1988, 88 12938

Int. Cl.[5] E02D *29/02*

U.S. Cl. 405—286 5 Claims



1. Retaining wall designed to be provided with vegetation, and constituted by dry-mounted upper and lower construction elements, by interfitting of the elements in one another, and by superposition on one another, each element comprising a bottomless container comprising vertical partitions, a first vertical partition (4), parallel to a front wall of the container, delimiting a large front space (5) which serves as a flower pot and at least one rear space (6) which serves as a root cavity for the upper container mounted recessed therefrom, offset rearwardly from the lower container, this latter space (6) being divided in at least two smaller spaces (7, 8) by a second vertical partition (9) perpendicular to the front wall and to the first partition; there

being a notch (10) disposed on each upper side edge of the lower container so as to receive a downwardly projecting portion of the upper container, and means defining at least one small space (14, 15) behind said notches of said lower container so as to permit supplementary vegetation.

4,964,762

COMBINATION OF CUTTER AND FASTNER UNIT THEREFOR

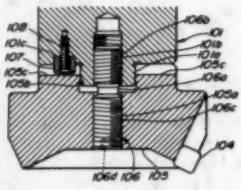
Tatsuo Arai, Kitamoto, and Takayoshi Saito, Nishishinagawa, both of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1988, Ser. No. 244,825

Claims priority, application Japan, Sep. 18, 1987, 62-142675; Sep. 22, 1987, 62-144715; Sep. 22, 1987, 62-144715

Int. Cl.[5] B26D 1/12

U.S. Cl. 407—34 7 Claims



1. A combination of a cutter body and a fastener unit for fastening said cutter body to a forward end of a tool attachment shaft in coaxial relation thereto, said forward end being formed in its end face with a threaded bore extending along an axis of rotation of said tool attachment shaft, said tool attachment shaft being adapted to rotate in a counterclockwise direction as viewed from said end face;

said cutter body having formed therein a threaded bore which extends through said cutter body in coaxial relation to said threaded bore in said forward end of said tool attachment shaft; and

said fastener unit including a fastener element having one and other axial end portions, said one axial end portion being provided on its outer peripheral surface with first, right-hand threads threadably engageable with said threaded bore in said forward end of said tool attachment shaft, said other axial end portion being provided on its outer peripheral surface with second, left-hand threads threadably engageable with said threaded bore in said cutter body, and an end face of said other axial end portion having an outer diameter substantially equal to an inner diameter of said threaded bore in said cutter body, whereby rotation of said tool attachment shaft further tightens said cutter body to said tool attachment shaft.

4,964,763

CUTTER HEAD

Walter Kieninger, Lahr, Fed. Rep. of Germany, assignor to Entwicklungszentrum fur Zerspanungstechnik GmbH & Co. KG, Lahr, Fed. Rep. of Germany

Filed Jan. 18, 1989, Ser. No. 298,653

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1988, 3801394

Int. Cl.[5] B26D 1/12

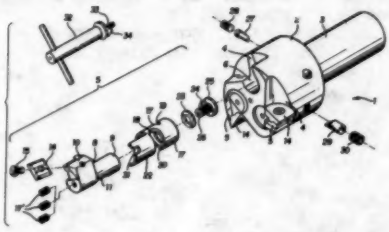
U.S. Cl. 407—40 11 Claims

1. In a cutter head of the type that includes a substantially cylindrical axially extending main body having spaced apart ends and a circumferential surface, one of said ends having an end face, the other of said ends having a machine mounting portion, said main body portion having a plurality of cavities each of which opens outwards onto both said end face and said circumferential surface, and a cutter blade carrier mounted for axial and radial adjustment in each of said cavities for holding at least one associated cutter blade;

the improvement comprising:

said cutter blade carrier (8) having an axial guide stem (9) and a cutter blade mounting portion (10),

an eccentric bushing (17) mounted in said main body in an axially fixed position;



said cutter blade carrier guide stem being mounted in said eccentric bushing and coupled therewith for axial adjustment;

said eccentric bushing being rotatable relative to said main body and to said cutter blade carrier; and

a clamping device (29, 30) for locking said cutter blade carrier in position.

4,964,764

FLOATING CHUCK WITH IRRIGATING FLOW

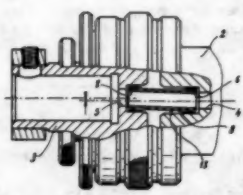
Andre Perrotto, Charly Vernaison, France, assignor to S M P 2 (Societe Anonyme de Droit Francais), Bron, France

Filed Nov. 3, 1989, Ser. No. 431,242

Claims priority, application France, Nov. 3, 1988, 88 15774

Int. Cl.[5] B23B 51/06

U.S. Cl. 409—136 6 Claims



1. A floating chuck comprising,

a body having a first fluid channel therein,

a bush movably mounted relative to the body and having a second fluid channel therein opposite to and approximately coaxial with the first fluid channel,

the first channel having an enlarged end sections and the second channel having an enlarged end section opposite the enlarged section of the first channel,

a rigid, non-deformable tube extending from the enlarged section of the first channel to the enlarged section of the second channel,

a circumferential, deformable sealing member disposed near each end of the tube received within an associated enlarged section, the outside diameter of each sealing member being greater than the inside diameter of the section in which the sealing member is received, and

the tube being shorter than the axial distance between the inner ends of the opposed enlarged sections.

4,964,765

CHAMFERING MACHINE

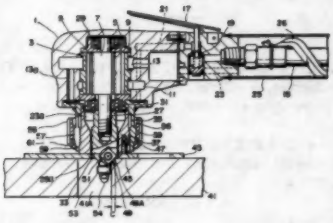
Katsunobu Kishi, Tokyo, Japan, assignor to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1990, Ser. No. 482,504

Claims priority, application Japan, Feb. 27, 1990, 1-21854[U]

Int. Cl.[5] B23C *1/20*; B27C *5/10*

U.S. Cl. 409—181 **5 Claims**



1. A chamfering machine comprising:

a casing;

rotating shaft projecting from one end of the casing;

a ring-shaped connector enclosing the rotating shaft and having a slit formed parallel to the center axis of the rotating shaft, and also having a downward slope formed on the outer circumference of its lower end portion;

a guide base having a ring-shaped boss detachably screwed into the ring-shaped connector;

a lock ring detachably screwed onto the ring-shaped connector, the lock ring having an upward slope formed on the inner circumference thereof and slidable on the downward slope of the ring-shaped connector, when the lock ring is rotated and moved in the axial direction of the rotating shaft, to clamp the connector in the center direction of the rotating shaft, to firmly engage the connector with the ring-shaped boss;

a cutting chip fixed to the rotating shaft which passes through the ring-shaped boss and having chamfering blades one of which partially projects from the underside of the guide base; and

guide means attached to the rotating shaft and projecting from the underside of the guide base to contact a side surface of a material to be chamfered.

4,964,766

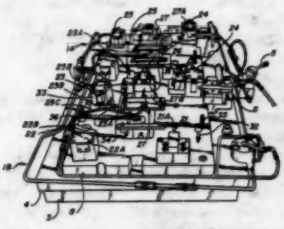
METHOD AND APPARATUS FOR MACHINING A CASTING SURFACE

Manuel C. Turchan, 25075 Fairway, and Frank J. Manduch, 24644 Cherry Hill Rd., both of Dearborn, Mich. 48124

Filed Nov. 25, 1987, Ser. No. 125,235

Int. Cl.[5] B23Q *3/00*

U.S. Cl. 409—225 **8 Claims**



1. An apparatus for precise positioning and securing of a relatively flexible die casting which minimizes distortion and vibration of said casting during a machining operation, said apparatus comprising:

a plurality of cast locating pins;

at least two opposed circumferential edge portions of said casting, said at least two opposed circumferential edge portions having mating holes engagable with said plurality of cast locating pins to provide precise vertical positioning of said casting for machining;

external actuation means in communication with at least one of said plurality of cast locating pins, said at least one of said plurality of cast locating pins being longitudinally movable via said external actuation means to engage and disengage from the casting;

vibration dampening means engagable with at least one of said at least two opposed circumferential edge portions of said casting; and

push clamp means mounted to press said casting against two of said locating pins prior to engagement of said at least one said plurality of cast locating pins with said casting.

4,964,767

METHOD FOR COMBINING INDIVIDUAL ROAD-TRANSPORT WITH RAIL-BOUND TRAIN-TRANSPORT, AND APPARATUS FOR IMPLEMENTING THE METHOD

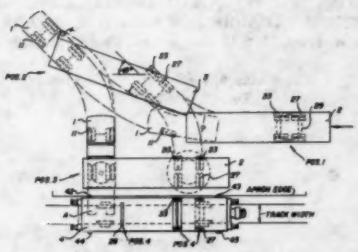
Ludwig Leitz, Laufdorfer Weg 33, D-6330 Wetzlar, Fed. Rep. of Germany

Filed Nov. 15, 1988, Ser. No. 271,291

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1987, 3739277

Int. Cl.[5] B61D *15/00*; B60P *3/77*

U.S. Cl. 410—65 **12 Claims**



1. A method for combining individual transport by road and railbound train transport with rapid transfer between one transport mode and the other, comprising:

(a) providing a tractor truck during road shipping of a semi-trailer;

(b) providing said tractor truck for cross-rolling said semi-trailer onto a low-platform railroad car and using said tractor truck for support for part of a load of said semi-trailer as a power source assisting in docking;

(c) further providing rollers integral with said semitrailer and connectable to said track truck with extensible energy lines and rolling said semi-trailer by said rollers onto said low-platform railroad car and disconnecting said energy lines after docking; and

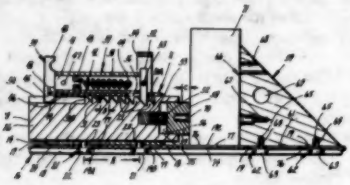
(d) thereafter providing said tractor truck for other transport purposes in individual traffic.

4,964,768

CARGO STABILIZING DEVICE

Douglas A. Shomo, 32841 Park La., Garden City, Mich. 48135

Filed May 15, 1989, Ser. No. 351,934
Int. Cl.[5] B61D 45/00
U.S. Cl. 410—94 12 Claims



1. A restraining device to be held rigidly but releasably on a support member at any of a plurality of locations spaced apart from one another by a first distance in a predetermined direction to limit movement of cargo in that direction, the restraining device comprising:

first engagement means at each of the locations;

main movable means;

second engagement means firmly joined to the main movable means to engage the first engagement means at any of the locations;

a movable member movably mounted with respect to the main movable means;

a plurality of teeth on the movable member, corresponding locations on adjacent teeth being spaced apart from one another by a second distance less than the first distance; and

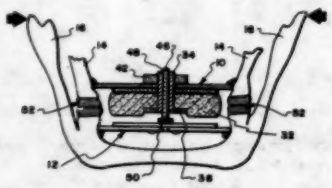
a pawl mounted on the main movable means and movable into engagement with any accessible tooth as determined by the position of the movable member to block the movable member in a fixed position relative to the main movable means according to which tooth is engaged.

4,964,769

AIR-ISOMETRIC TEMPOROMANDIBULAR JOINT AND VERTICAL CLOSURE JAW RELATOR APPARATUS

Martin M. Hass, 1055 El Medio Ave., Pacific Palisades, Calif. 90272

Filed May 4, 1989, Ser. No. 348,600
Int. Cl.[5] A61C 9/00
U.S. Cl. 433—214 5 Claims



1. An apparatus for producing a desired vertical jaw closure while air balancing both the muscle action and temporomandibular joint function during chewing, in a human mouth, comprising:

a first and a second annular, flat support member, each adapted to fit into the human mouth and be mounted upon the upper and lower jaws, respectively, of the human mouth in spaced, vertically aligned juxtaposition, each having a protrusion on its periphery and each further having pivotally mounted thereon a pair of arm members adapted to swing in an arcuate fashion outwardly therefrom for engaging the upper and lower jaws to hold its respective support member in a fixed, known relation to the jaw which it is mounted;

means operatively connected between said first and second support members for providing an adjustable isometric air pressure resistance during vertical closure of the jaws; and

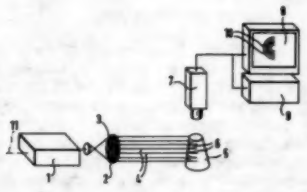
means operatively connected between said first and second support members for selectively controlling the minimum rest-close vertical closure possible between said first and second support members mounted in spaced, vertically aligned juxtaposition in the mouth.

4,964,770

PROCESS OF MAKING ARTIFICIAL TEETH

Hans Steinbichler, Am Bauhof 4 8201, Neubeuern, and Jürgen Willer, Payerstrasse 30 7410, Reutlingen, both of Fed. Rep. of Germany

Filed Jul. 12, 1988, Ser. No. 218,101
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1987, 3723555
Int. Cl.[5] A61C 5/10
U.S. Cl. 433—223 12 Claims



1. A process of making artificial teeth comprising,

generating horizontal or other contour lines on a ground tooth and on adjacent surfaces,

acquiring data derived from said lines by optoelectronic means,

computing the three-dimensional shapes of the tooth and of the required artificial tooth from said data in accordance with the formula

$$I = a \times (1 + m \times \cos \theta) \quad (I)$$

wherein:

I = intensity

a = background brigthness

m = contrast

θ = angle,

and

forming an artificial tooth having the required shape as determined by said data.

4,964,771

CARGO RESTRAINER

Timothy N. Callihan, 2471 Pheasant Run Dr., Marylands Heights, Mo. 63043

Filed May 10, 1989, Ser. No. 350,004
Int. Cl.[5] B61D 45/00
U.S. Cl. 410—118 17 Claims

1. A cargo restrainer for restraining cargo carried in a vehicle compartment having walls, such as the bed of a pick-up truck, the cargo restrainer comprising,

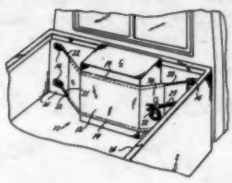
a generally rectangular panel of flexible material having sleeves extending along opposing edges thereof,

a plurality of anchors adapted to be mounted at spaced apart locations on at least one wall of the vehicle compartment,

cord means extending through the sleeves of the panel and engaging the anchors at said locations to suspend the panel between the anchors with the panel opposing a wall of the vehicle compartment whereby cargo may be placed

between the wall and the panel for restraint of the cargo during transport, and

locking means for holding said cord means at a predetermined tension, said locking means comprising a locking member for receiving end portions of said cord means therethrough, and a lever associated with said locking member adapted for movement from a first position in



which said end portions are free of engagement by the lever whereby the tension in said cord means and thus the restraining force applied by the panel to the cargo may be adjusted by varying the length of said end portions extending through said locking member, and a second position in which the lever engages said end portions for releasably locking said end portions in said locking member to hold the tension applied to said cord means.

4,964,772

FIXING PEG FOR USE IN FRIABLE MATERIALS

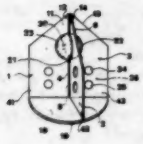
Willy Es, Asnieres, France, assignor to Plombelec, Loire, France

Filed Dec. 27, 1989, Ser. No. 457,669

Claims priority, application France, Dec. 28, 1988, 88 17296

Int. Cl.[5] F16B *15/00, 39/02*

U.S. Cl. 411—82 **10 Claims**



1. A fixing peg suitable for being implanted in a friable material such as expanded polystyrene, for example, the peg comprising:

at least one oblong tab made from a thin plate of stiff material, said tab having a first end suitable for penetrating into said friable material;

a head fixed to the second end of said tab, the section of said head being larger than the cross-section of said tab so that together they form a shoulder;

wherein the peg further comprises:

a closed pouch made of a flexible material capable of being punctured and suitable for containing a glue capable of gluing together the friable material and the rigid material of said tab;

puncturing means associated with said tab for puncturing the pouch; and

means for maintaining said pouch in co-operation with said tab in such a manner that when thrust is applied to said pouch having at least a component substantially oriented from the first end of the tab towards the second end thereof, said pouch co-operates with said puncturing means to enable said glue to run over at least a portion of the wall of said tab.

4,964,773

ANTI-THEFT APPARATUS INCLUDING A SCREW WITH AN ANTI-THEFT SAFETY HEAD

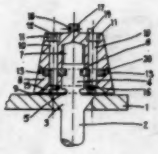
Reinhold Schmidt, Talhanser Strasse 62, Ebringen, Fed. Rep. of Germany

Filed Sep. 21, 1989, Ser. No. 410,703

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1988, 3832359

Int. Cl.[5] F16B *19/00, 33/00, 43/00*

U.S. Cl. 411—373 **24 Claims**



1. An anti-theft apparatus, comprising: an anti-theft safety head for use with a threaded fastener, said safety head having a bore which removably receives a substantially cylindrically constructed tool extension part extending from the fastener, and at least two rotatably supported pins arranged substantially parallel next to the bore in the anti-theft safety head, said pins each being connected rotationally fixed to a respective locking member, each said locking member being movable into an annular groove on the tool extension part by rotating the associated said pin and each being movable to a predetermined angular position in which same is free of engagement with said groove, an upper end area of each of the pins, which upper end area is accessible from outside said safety head, being constructed as an adjusting tool adapter segment.

4,964,774

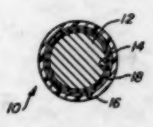
COATED METAL FASTENER

Geronimo E. Lat, Prospect Heights, and William L. Gabriel, Barrington, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Sep. 29, 1989, Ser. No. 414,793

Int. Cl.[5] F16B *15/00*

U.S. Cl. 411—446 **10 Claims**



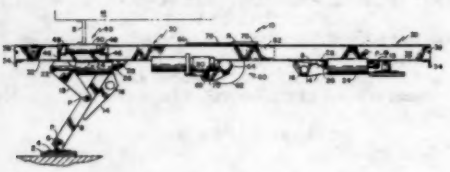
1. A metal fastener suitable for use in wood construction, having a thermoplastic, predominately aliphatic polyurethane coating over substantially its entire metal surface, and provided with a zinc layer and a chromate conversion layer between said polyurethane coating and the metal surface of the fastener, said zinc layer being contiguous with the metal surface of the fastener.

4,964,775

MOBILE HOME POSITIONER

Donald W. Youmans, 427 Cedar Riverway, Sacramento, Calif. 95831

Filed Jun. 1, 1988, Ser. No. 200,913
Int. Cl.[5] B66F *11/00*
U.S. Cl. 414—12 10 Claims



9. A positioner for a mobile home or the like, comprising in combination:

trolley support means,

extensible leg means fixed to a portion of said trolley support means to change its elevation,

and a plurality of trolley means rotatably carrie along said trolley support means whereby said trolley means moves freely along said trolley support means while supporting the mobile home to align the mobile home with another mobile home,

wherein said extensible leg means depend from a side portion of said trolley support means and includes a first leg extending from an outer face of an "I" beam and carried thereon by means of a sliding block which moves along outwardly faced C-shaped channel portions of said "I" beam.

an end of said leg remote from said sliding block is interconnected to another leg by means of a transverse platform which in turn is supported by an underlying foot,

said leg remote end is pivotally attached to said platform through an ear,

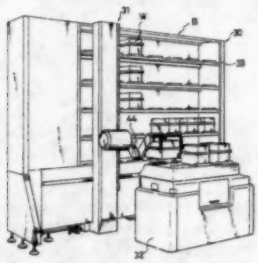
and a bell crank extends from said leg to a lower surface of each said "I" beam, and is interconnected to another bell crank by a transverse rod and is driven by a hydraulic cylinder which depends from a lower portion of said "I" beams by a cylinder support rod.

4,964,776

ARTICLE TRANSFER AND STORAGE SYSTEM

Yuji Wakita, and Hideaki Haruna, both of Himeji, Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

Filed Nov. 1, 1988, Ser. No. 265,839
Claims priority, application Japan, Dec. 1, 1987, 62-301516; Dec. 28, 1987, 62-197418[U]; Apr. 20, 1988, 63-52122[U]
Int. Cl.[5] B65G *1/04*
U.S. Cl. 414—277 13 Claims



1. An article transfer and storage system of the type including an upstanding stationary stocker having a plural number of vertically spaced storage shelves in an upper portion thereof and a stock handler located for movement along the front side of said stationary stocker and having access to the front of said shelves for transferring articles with respect to said shelves, said stock handler including a traveling drive section for movably supporting and moving said stock handler along the front of said stationary stocker, the improvement wherein;

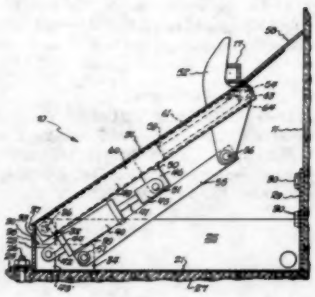
said traveling drive section of said stock handler is housed internally of and movably guided within a lower portion of said stationary stocker and underlies said shelves, and wherein said storage system includes means for supporting said stationary stocker upon a floor surface.

4,964,777

TRUCK RESTRAINING DEVICE

Joseph P. H. Kleynjans, and Walenty Kalempa, both of Coraopolis, Pa., assignors to Eriks Holding N.V., Netherlands

Filed Apr. 11, 1988, Ser. No. 180,360
Int. Cl.[5] B65G *67/02*
U.S. Cl. 414—401 12 Claims



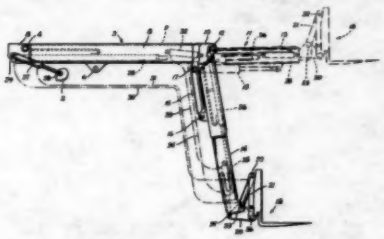
1. A restraint device for restraining a vehicle having an ICC bar relative to a wall comprising a base, a raisable member, securing means movably securing said raisable member to said base, hand means mounted on said raisable member for movement therewith for engaging said ICC bar, and motor means for raising said raisable member into a raised position and for causing said hand means to engage said ICC bar with a biasing force toward said wall after said raisable member has been raised to said raised position, said motor means comprising a first motor for raising said raisable member, and a second motor for causing said hand means to engage said ICC bar with said biasing force, said base including a first portion proximate said wall and a second portion remote from said wall, said securing means comprising a pivotal connection between said base and said raisable member proximate said second portion, said first motor means comprising an hydraulic motor coupled between said base and said raisable member, said second motor means comprising a second hydraulic motor mounted relative to said raisable member, said hand means comprising lever means having lower and upper opposite end portions and a central portion therebetween, pivot means located at said central portion for pivotally mounting said hand means on said raisable member, and elongated link means coupled between said base and said lower end portion for causing said hand means to pivot about said pivot means when said raisable member is raised to thereby move said upper portion in a direction upwardly from said raisable member.

4,964,778

FORKLIFT TRUCK HAVING A TELESCOPIC AUXILIARY BOOM ARTICULATED TO A TELESCOPIC MAIN BOOM

James A. Muto, and Ramesh P. Patel, both of Hagerstown, Md., assignors to Kidde Industries, Inc., Iselin, N.J.

Filed Jul. 27, 1989, Ser. No. 385,445
Int. Cl.[5] B66F 9/06
U.S. Cl. 414—700 14 Claims



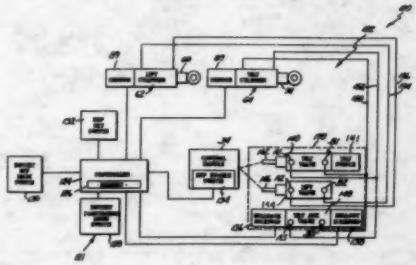
14. A forklift truck, comprising a truck frame, a telescopic main boom having one end pivotally connected to the truck frame, a telescopic auxiliary boom having one end pivotally connected to the opposite end of the main boom, and a fork assembly pivotally connected to the opposite end of the auxiliary boom, said main boom including a base section and a fly section slidably mounted therein, said auxiliary boom including a base section and a fly section slidably mounted therein, the base section of the main boom being pivotally connected to the truck frame, the base section of the auxiliary boom being pivotally connected to the fly section of the main boom, a lift cylinder connected between the truck frame and the base section of the main boom for luffing the main boom relative to the truck, a second lift cylinder connected between the fly section of the main boom and the base section of the auxiliary boom, and a moveable nose portion pivotally connected to said fork assembly and pivotally connected to the outer end of said auxiliary boom fly section, first slave cylinder means connected between said fork assembly and said pivotal connection of said moveable nose portion to the outer end of the auxiliary boom fly section, first master cylinder means operatively connected to said first slave cylinder means, and said first master cylinder means pivotally connected between said main boom base section and said truck frame, second slave cylinder means connected between the auxiliary boom fly section and said moveable nose portion, second master cylinder means operatively connected to said second slave cylinder means, said second master cylinder means pivotally connected between said main boom fly section and said auxiliary boom base section, whereby the auxiliary boom is articulated to the main boom and movable relative thereto between a position wherein the auxiliary boom is substantially aligned with the longitudinal axis of the main boom to a position wherein the auxiliary boom depends from the end of the main boom in an inclined position in a vertical plane in proximity to the front wheels of the truck, and the fork assembly is maintained in a horizontal position during all articulated positions of the main boom and the auxiliary boom, whereby a load can be carried on the fork assembly close to the truck front wheels, thereby enhancing the stability and driveability of the truck in the travel mode.

4,964,779

ELECTRONIC BUCKET POSITIONING AND CONTROL SYSTEM

Thomas M. Sagaser, Bismarck, N. Dak., assignor to Clark Equipment Company, South Bend, Ind.

Division of Ser. No. 903,160, Sep. 3, 1986, Pat. No. 4,844,685.
This application Apr. 17, 1989, Ser. No. 339,389
The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.
Int. Cl.[5] B66C 23/00
U.S. Cl. 414—708 8 Claims



1. A vehicle comprising:
a support structure;
a boom assembly pivotally mounted with respect to the support structure;
an attachment pivotally mounted to the boom assembly;
a lift mechanism for driving the boom assembly with respect to the support structure;
a lift control handle actuated by an operator to control the lift mechanism;
a tilt mechanism for driving the attachment with respect to the boom assembly;
a tilt control handle actuated by an operator to control the tilt mechanism and drive the attachment to a selected predetermined angular relationship with respect to the support structure;
a tilt switch responsive to the position of the tilt control handle for providing tilt signals representative of operator actuation of the tilt control handle;
an electrically actuated tilt actuator responsive to tilt control signals for controlling the tilt mechanism;
a sensor for providing position signals representative of the position of the attachment with respect to the support structure;
memory for storing digital data representative of a selected predetermined angular relationship between the attachment and the support structure;
a digital controller coupled to the sensor, memory, tilt switch and electrically actuated tilt actuator, for automatically causing data representative of the angular relationship of the attachment with respect to the support structure selected by an operator through actuation of the tilt control handle to be stored in the memory as the selected predetermined angular relationship in response to the tilt signals, and for providing positioning tilt control signals causing the attachment to maintain the predetermined angular relationship with respect to the support structure as the boom assembly is driven with respect to the support structure; and
a positioning mode switch coupled to the digital controller for enabling and disabling production of the tilt control signals by the digital controller, in response to operator actuation.

4,964,780

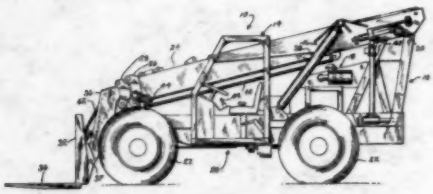
EXTENDIBLE BOOM FORKLIFT WITH LEVEL REACH CONTROL

Robert Karvonen, R.R. #1, Box 203A, Pelkie, Mich. 49958

Filed Jan. 11, 1988, Ser. No. 142,548

Int. Cl.[5] B66C *23/00*

U.S. Cl. 414—728 **21 Claims**



1. An apparatus, comprising:

a vehicle frame;

two or more elongated members mounted to said frame, said members having a proximal end adjacent the mounting of said two or more members to said frame and a distal end spaced therefrom, one of said members being movable toward and away from said frame;

an upper shaft mounted to said two or more members adjacent the proximal end thereof;

a lower shaft mounted to said vehicle frame; and

a direction controlling apparatus including control means operative between said upper and lower shafts for maintaining a constant direction of movement of a predetermined point along the length of said two or more members relative to said vehicle frame during movement of said movable member toward and away from said frame, said control means comprising;

an extendible member movably mounted at its ends to said upper and lower shafts and including a first portion and an extendible second portion;

clamping means associated with the first portion of said extendible member for selectively clamping said second extendible portion of said extendible member;

drive means for moving said extendible member linearly along said upper and lower shafts after actuation of said clamping means during movement of said movable member toward and away from said vehicle frame, said drive means moving said extendible member along said shafts in an amount proportional to the movement of said movable member so that, when said upper and lower shafts are nonparallel, said movement of said extendible member therealong tends to compress or elongate said extendible member; and

adjustment means responsive to the tendency of said extendible member to compress or elongate during movement of said movable member, for adjusting the angle between the proximal end of said two or more members and said vehicle frame, and thereby between said upper shaft and said lower shaft, during movement of said movable member toward and away from said vehicle frame.

4,964,781

APPARATUS FOR SORTING, STACKING AND CONVEYING PLATE WORKPIECES

Erwin Jenkner, Lindenstr. 13, D-7261 Gechingen-Bergwald, Fed. Rep. of Germany

Filed Oct. 22, 1987, Ser. No. 112,533

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1986, 3636107; Oct. 24, 1986, 3636323

Int. Cl.[5] B65G *35/00*

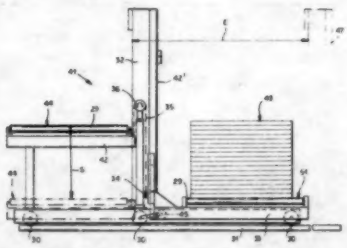
U.S. Cl. 414—790.7 **10 Claims**

1. An arrangement for conveying and stacking final products created by subdivision of a succession of plate blanks into a plurality of such products, the arrangement comprising:

a sorting table at an upper level;

means including an input conveyor for supplying the products in a longitudinal transport direction at the upper level to the sorting table;

means including an output conveyor offset laterally from the input conveyor for transporting stacks of the products away from the sorting table in the transport direction and having an upstream end laterally adjacent the sorting table at a lower level below the upper level of the input conveyor, whereby the products can be moved on the sorting table at the upper level to either of two stacking substations longitudinally aligned with the upstream end of the output conveyor; and



respective stacking units at the substations each in turn having

a stacking table displaceable vertically between the upper and lower levels and horizontally displaceable transversely of the transport direction between a basic position at the respective substation for receiving the final products therefrom and an extended position aligned longitudinally with the output conveyor for delivering the final products thereto; and

a conveyor section fixed to and displaceable jointly transversely with the stacking table such that in the basic position of the respective stacking table the conveyor section forms a longitudinal continuation of the output conveyor.

4,964,782

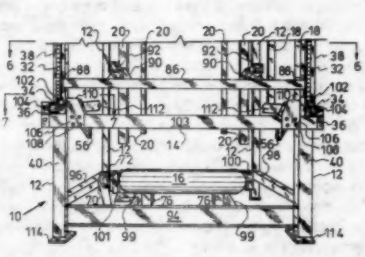
PALLET DISPENSING MACHINE WITH LATCH MECHANISM

Charles E. DeCrane, 802 Janna St., West Monroe, La. 71291

Filed Aug. 24, 1989, Ser. No. 398,145

Int. Cl.[5] B65G *59/06*; B65H *3/00*

U.S. Cl. 414—798.1 **8 Claims**



1. A pallet dispensing machine for dispensing the bottom pallet, from the bottom of a vertical stack of pallets, comprising:

(a) a stationary outer frame;

(b) a vertically movable inner frame, carried by the outer frame and movable thereon upwardly and downwardly;

(1) a plurality of latch means, fixedly attached to the inner frame, each latch means having pivotably mounted thereon a latch arm for movement into engagement and out of engagement with the penultimate pallet; each latch means being gravity activated to move out of engagement and being ramp activated to move the latch means into engagement;

(c) drive means, fixedly attached to the outer frame, for raising and lowering the inner frame as desired;

(d) a pallet feeder conveyor, fixedly attached to the outer frame for moving the bottom pallet horizontally away from the pallet machine as desired; and

(e) control means, associated with the pallet machine for controlling the upward and downward motion of the inner frame as well as the feeder conveyor to move the bottom pallet horizontally away from the pallet machine.

4,964,783

DEVICE FOR EMPTYING A LIQUID-COLLECTION TANK IN A WATER-CONDUCTING HOUSEHOLD APPLIANCE

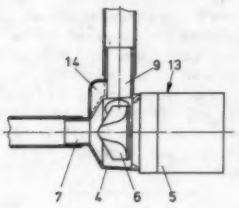
Hans Haverkamp, Oerlinghausen, Fed. Rep. of Germany, assignor to Hanning Electro-Werke GmbH & Co., Oerlinghausen, Fed. Rep. of Germany

Filed Nov. 2, 1988, Ser. No. 266,117

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1988, 8805234[U]

Int. Cl.[5] F04D *29/00*

U.S. Cl. 415—52.1 **4 Claims**



1. An arrangement for emptying a liquid collection tank in a water-conducting household appliance such as a washing machine or dish washer, comprising: a centrifugal pump with a housing holding a floating impeller; a liquid collection tank on said alliance; an axial suction connection with a tubular connector extending out of said liquid collection tank and to said housing; a radial delivery connection on said housing for diverting liquid conveyed by said pump; a recirculation channel communicating at one end with said radial delivery connection and extending into said suction connection at another end for diverting liquid conveyed into the vicinity of said suction connection and emptying into said tubular connector; said recirculation channel having a cross-section of said delivery connection and the cross-section of said suction connection; said recirculation channel being shaped into said housing in form of a substantially narrow gap that open radially toward said impeller; said recirculation channel having a pressure difference between said one end and said other end for circulating liquid in said pump housing to eliminate noise effects in said centrifugal pump; said open gap preventing also foreign matter from depositing in said recirculation channel and clogging said channel.

4,964,784

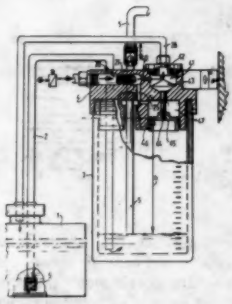
VOLUMETRIC DOSING APPARATUS

Herman Vanderheyden, 24 Rostijnedreef, 9880 Aalter, Belgium

Continuation of Ser. No. 768,438, Aug. 22, 1985, abandoned. This application Jul. 24, 1987, Ser. No. 77,172

Int. Cl.[5] F04B *23/14*

U.S. Cl. 417—86 **17 Claims**



9. A liquid dosing device comprising the combination of an airtight measuring vessel having a bottom and a top, liquid inlet conduit means for unidirectionally filling the measuring vessel with a supply of liquid to a filled level therein, discharge conduit means communicating at a predetermined level within the measuring vessel between the bottom thereof and said filled level for unidirectionally dispensing that amount of liquid contained between the filled level and the predetermined level and for venting the interior of the measuring vessel when the liquid level falls below said predetermined level, air bleed conduit means for bleeding air from the measuring vessel as the supply of liquid is being introduced thereinto, unitary float valve means located within the measuring vessel above said predetermined level for unitary movement between a raised, buoyed position in response to liquid rising to the filled level and a lowered, unbuoyed position in response to cessation of dispensing conditions within the measuring vessel after it has been filled with liquid to the filled level, to commence filling of the measuring vessel through said inlet conduit means, and pneumatic pressure flow means for subjecting the interior of the measuring vessel to sequential filling and dispensing conditions in response respectively to the unbuoyed position of the float valve means and the buoyed position of the float valve means, the pneumatic pressure flow means retaining the float valve means in the raised, buoyed position at the termination of the dispensing condition so that the pneumatic pressure flow means must be turned off and then on again in order to initiate another cycle of filling and dispensing.

4,964,785

PUMP ASSEMBLY

Siegfried Schoenwald; Eberhard Breyer, both of Bad Neustadt, and Hans-Georg Trojahn, Saal, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 31, 1989, Ser. No. 429,828

Claims priority, application European Pat. Off., Nov. 7, 1988, 88118521.9

Int. Cl.[5] F04B *35/04*

U.S. Cl. 417—360 **12 Claims**

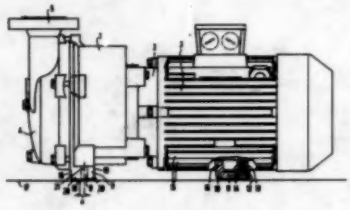
1. A pump assembly comprising:

a motor including a motor housing and a projection extending radially from the underside thereof;

a pump including a housing having a first end coupled to said motor and a second end covered by a cover member;

two laterally spaced legs extending from said pump housing at a location adjacent to said second end, each leg having

a mounting hole formed therethrough for securing the pump assembly to a mounting surface and an undersurface including a linear support surface, said linear support surface being in the vicinity of the center of said mounting hole and formed by recessed surfaces adjacent thereto which extend axially toward the outer sides of the leg;



a base plate for further securing said pump assembly to said mounting surface, said base plate only being fastened to said pump assembly at said motor projection; and

means for preventing relative rotation between said motor and said base plate.

4,964,786

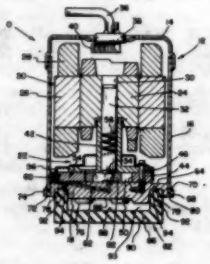
COMPRESSOR MOUNTING APPARATUS

Michael J. Maertens, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Jun. 14, 1989, Ser. No. 365,696

Int. Cl.[5] F04B *39/00*

U.S. Cl. 417—363 **9 Claims**



1. A vertically upright hermetic compressor assembly for mounting to a horizontal support surface, comprising:

a housing including a bottom end, said bottom end having an annular downwardly facing groove;

a motor compressor unit operably disposed within said housing;

a resilient mounting boot, abutting said housing bottom end, for mounting said compressor to a horizontal support surface, said mounting boot comprising a resilient body member having an annular sidewall with a rim engaged within said groove to support vertically said housing, and said body further having a base with a planar lower surface adapted to abut the horizontal support surface, and an upper surface facing said housing bottom end and spaced therefrom to define an enclosed space between said housing bottom end and said base upper surface thereby isolating noise produced by said motor compressor; and

bonding means contacting said groove and said sidewall rim for securing together said housing and said mounting boot.

4,964,787

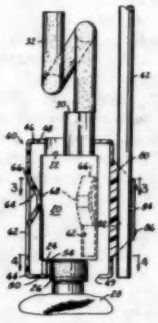
ELECTRIC VEHICLE PUMP ISOLATION MOUNT

Thomas M. Hoover, Reese, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Apr. 6, 1989, Ser. No. 333,906

Int. Cl.[5] F04B *35/04*

U.S. Cl. 417—363 **2 Claims**



1. In a vehicle having a fuel tank and an electrically driven pump in said tank for furnishing fuel under pressure to an engine, a pump mount for reducing the transmission of noise and vibration to the vehicle passenger compartment which comprises:

(a) a pump having generally cylindrical side walls with end walls lying in planes transverse to the pump axis,

(b) a generally cylindrical outer container surrounding said pump having side walls spaced from said side walls of said pump and end walls formed by inturned flanges spaced from the end walls of said pump and having openings at each end within said flanges whereby liquid in a fuel tank may flow around said pump through said outer container,

(c) means to support said pump radially and axially within said outer container comprising resilient strike-out portions from the walls of said outer container spaced circumferentially around said side walls having root portions integral with said container side walls and inwardly extending portions to contact the side walls of said pump to center the pump in said container spaced from the walls of said container.

4,964,788

HERMETIC TERMINAL WITH TERMINAL PIN ASSEMBLIES HAVING FUSIBLE LINKS AND MOTOR COMPRESSOR UNIT INCLUDING SAME

Terry Itameri-Kinter, North Attleboro; David W. Sauerbrey, Somerset, both of Mass., and Victor Troia, North Providence, R.I., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed Mar. 21, 1990, Ser. No. 497,086

Int. Cl.[5] F04B *35/04;* H01R *13/68;* H01B *17/30*

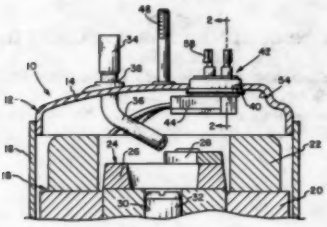
U.S. Cl. 417—422 **20 Claims**

15. A hermetic terminal for interrupting the electrical current supplied to a hermetic compressor in the event of an overcurrent condition, comprising:

a body member; and

a current conducting pin assembly passing through said body member, said pin assembly comprising a first electrically conductive pin segment, a second electrically conductive pin segment, an electrically insulating sleeve member interconnecting said first pin segment and said second pin segment, said sleeve member defining a closed cavity with said first pin segment and said second pin segment, and an electrically conductive fusible link electrically interconnecting said first pin segment and said

second pin segment, said fusible link having opposite ends and being disposed within said closed cavity, said first pin segment being connected to one of said opposite ends of



said fusible link at a first brazed joint, and said second pin segment being connected to the other of said opposite ends of said fusible link at a second brazed joint.

4,964,789

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

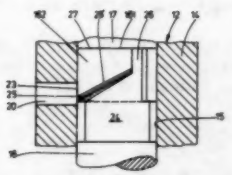
Hans Schueler, Ebersberg; Heinz Lauterbach, Esslingen; Helmut Tschoeke, Ostfildern; Richard Kinzel, Lautertal, all of Fed. Rep. of Germany, and Theodor Stipek, Hallein, Austria, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 27, 1989, Ser. No. 302,286

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1988, 3804843

Int. Cl.[5] F04B *7/04*; F02M *59/26*

U.S. Cl. 417—494 **12 Claims**



1. A fuel injection pump for internal combustion engines having an axially reciprocating pump piston (16) including a jacket face (162) guided in a cylinder (14) and including an end face (161)which defines a high-pressure chamber (17), at least one recess (24) on the jacket face of said pump piston arranged to communicate continuously with the high pressure chamber via a stop groove (26), said at least one recess having a diversion edge (25), said pump piston further being rotatable about its longitudinal axis for adjustment of the usable supply stroke having at least one control bore (20, 21) having a control opening (23) in the cylinder wall arranged to cooperate with the pump piston and further adapted to communicate with a low-pressure chamber (22) with said supply stroke of the pump piston being closed by the pump piston jacket face after a control edge (27) disposed near the piston end face which defines said high-pressure chamber has moved there past, said supply stroke further being uncovered toward said high-pressure chamber upon passage of said diversion edge, a pre-diversion groove (28) in said jacket face of said pump piston to reduce cavitation damage, further in which said pre-diversion groove (28) has an upper open end closest to said end face (161) which communicates continuously with said high-pressure chamber (17) via said stop groove (26) and includes a closed end on said jacket face, said pre-diversion groove (28) is spaced apart by a distance from the diversion edge (25) which is approximately 20 to 50% of a diameter of said control opening (23) such that, immediately before the entry of the diversion edge (25) into the control opening (23), said pre-diversion groove (28), connects the high-pressure chamber (17) to the control opening (23).

4,964,790

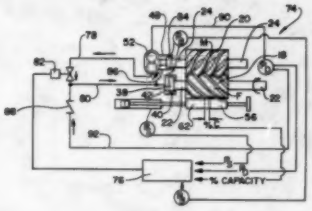
AUTOMATIC REGULATION OF BALANCING PRESSURE IN A SCREW COMPRESSOR

James C. Scott, Michigan City, Ind., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 10, 1989, Ser. No. 418,627

Int. Cl.[5] F01C *1/16*

U.S. Cl. 418—1 **40 Claims**



1. A rotary screw compressor including:

a casing having intersecting cylindrical cavities within which meshing male and female rotors are located on parallel axes;

an inlet at a low pressure end of the compressor and an outlet at a high pressure end of the compressor;

means for sensing the pressure of a gas flowing through said inlet;

means for sensing the pressure of said gas flowing through said outlet;

pressure applying means for applying a balancing pressure to at least one of the rotors to adjust the longitudinal position thereof; and

microprocessor control means coupled to said pressure applying means for controlling the same as a function of said balancing pressure computed in response to an input of said pressure of said gas sensed at the inlet and the outlet.

4,964,791

APPARATUS FOR MANUFACTURING POWDER

Fumihiko Sakuno, Chiba; Hirofumi Sonoda, Sakura; Satoshi Honda, Tokyo, and Ryouhei Kumagae, Machida, all of Japan, assignors to Nippon Steel Welding Products & Engineering Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1989, Ser. No. 446,360

Claims priority, application Japan, Dec. 5, 1988, 63-307289

Int. Cl.[5] B01J *2/00*; B22F *9/10, 9/14*

U.S. Cl. 425—8 **7 Claims**

1. An apparatus for manufacturing powder comprising

a first and a second vessel member which are movable relative to each other for defining a hermetically sealed space in which granulation takes place;

a rotary shaft supported by the first vessel member and carrying support means at its free end which are used to support a member of raw material disposed within the hermetically sealed space;

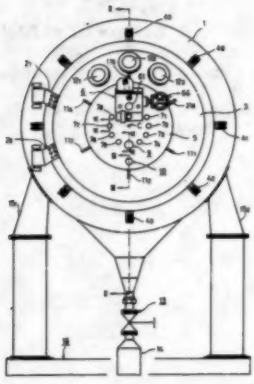
drive means for driving the rotary shaft for rotation at a high speed;

a support base rotatably mounted on the second vessel member about a center of rotation which is displaced from the axis of the rotary shaft and extending parallel thereto;

a plasma torch supported by the support base on a circumference centered about the center of rotation thereof and struck therefrom with a radius equal to a distance mea-

sured from the center of rotation to the axis of the rotary shaft;

a plurality of raw material holders supported by the support base on the circumference and each carrying a member of raw material;



means for securing the member of raw material on one of the holders to the support means on the rotary shaft; and

a handler supported by the support base on circumference for removing the member of raw material supported by the support means on the rotary shaft from the support means.

4,964,792

UPPER METAL MOLD CLAMP DEVICE IN A TIRE VULCANIZING MACHINE

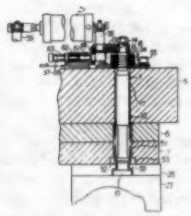
Hideaki Katayama; Toshifumi Murakami, both of Nagasaki; Koji Soeda, Kobe; Yoshiya Kubota; Shoji Okamoto, both of Toyota; Akinori Kubota, Kobe; Michihito Kobayashi, Toyota, and Masaaki Ijiri, Aichi, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Sumitomo Rubber Industries Ltd., Hyogo, both of, Japan

Filed Nov. 9, 1989, Ser. No. 433,778

Claims priority, application Japan, Nov. 11, 1988, 63-283800

Int. Cl.[5] B29C *33/02, 33/26*

U.S. Cl. 425—32 **8 Claims**



1. A tire vulcanizing apparatus, comprising: an upper mold clamp device, an upper metal mold detachably fixed to a bolster by rotating a plurality of clamp rods vertically penetrating through the bolster and provided with clamp claws at their bottom ends; said clamp device having drive units for rotating the respective clamp rods independently of rotation of the other clamp rods, nuts mounted onto the bolster plate in an unrotatable but vertically movable manner and threadably engaged with male screws at the upper portions of the clamp rods, the clamp claws occupying spaces formed around the clamp rods on the bottom surface of an upper heat plate held in contact with the upper metal mold.

4,964,793

SOLAR INDUCTION MONORAIL FABRICATION APPARATUS

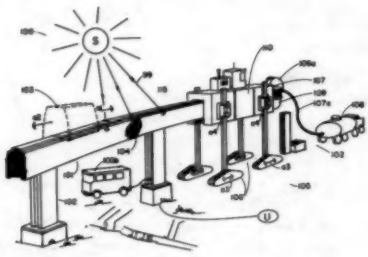
Mark J. Antosh, 4009 N. Stone Ave., Tucson, Ariz. 85705

Division of Ser. No. 174,422, Mar. 28, 1988, Pat. No. 4,885,995.

This application Dec. 7, 1989, Ser. No. 447,208

Int. Cl.[5] B29C *47/06;* **B28B** *11/04*

U.S. Cl. 425—62 **14 Claims**



1. A monorail structure fabrication machine for fabricating a solar collector monorail sturcture, said monorail structure fabrication machine comprising:

(a) a fabrication chamber means for fabricating a solar collector monorail structure of a solar energy collecting monorail system, said fabricating chamber means including means for forming a monorail member and means for forming a solar collector layer on the monorail member; and

(b) an elevation compensating track driven assembly means to which said fabrication chamber means is mounted for moving along a designated monorail construction right-of-way.

4,964,794

INSTALLATION FOR DEEP-DRAWING AND BACK-FOAMING OF UPHOLSTERY COVERS

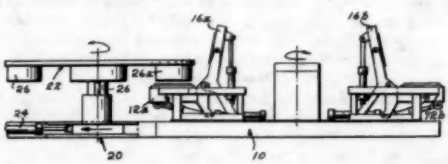
Horst Ubelacker, Hohenburg; Helmut Storch, Amberg, and Peter Buchwald, Sulzbach-Rosenberg, all of Fed. Rep. of Germany, assignors to Integram Inc., Newmarket, Canada

Filed Jul. 10, 1989, Ser. No. 377,102

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1988, 3823690

Int. Cl.[5] B29C *39/10, 51/26*

U.S. Cl. 425—117 **4 Claims**



1. An installation for deep-drawing and back-foaming of upholstery covers comprising

a rotatable table having a series of deep-drawing molds arranged thereon so as to be moved successively into and out of a stationary stretch piston station,

a plurality of stretch pistons,

means for mounting said plurality of stretch pistons for

selective movement of any one of said stretch pistons into a working position within said stationary stretch piston station and thereafter through a working movement in cooperating relation with a deep-drawing mold moved into said stretch piston station whereby a cover stretched on a deep-drawing mold in said stretch piston station is pressed into the mold by the stretch piston in said working position during the working movement thereof,

said series of deep-drawing molds including a plurality of deep-drawing molds of different configuration,

said plurality of stretch pistons including a stretch piston individually configured to cooperate with each deep-drawing mold of different configuration.

4,964,795

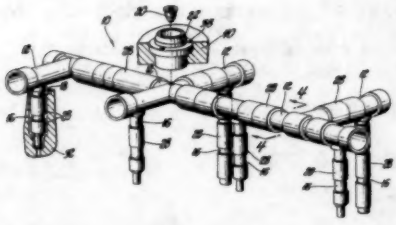
MANIFOLD ASSEMBLY FOR PLASTIC INJECTION MOLDING

Patrick A. Tooman, 2644 Penna St., W. Bloomfield, Mich. 48033

Continuation of Ser. No. 806,622, Dec. 9, 1985, abandoned. This application Jan. 11, 1988, Ser. No. 144,600

Int. Cl.[5] B29C *45/22*

U.S. Cl. 425—144 **5 Claims**



1. A manifold assembly (10) for conveying plastic injection molding material into a mold (32) from a molding material supply through a support (40), said assembly comprising:

a manifold (12) including a manifold flow passage (14) extending therealong;

a support member (40) for supporting said manifold (12);

at least one nozzle (16) extending radially outwardly from said manifold (12) to a distal end, said at least one nozzle (16) including a central nozzle passage (17) extending from and in fluid communication with said manifold flow passage (14);

insulating means (18,20,22,26,34) for thermally insulating said manifold (12) from the support member (40) and for thermally insulating said manifold (12) and said at least one nozzle (16) from the mold (32);

said insulating means (18) including an insulating ring disposed about said at least one nozzle (16) in spaced relationship from said distal end of said at least one nozzle (16) to space said at least one nozzle (16) radially from said mold (32), said ring (18) being the only path for conductive thermal energy from said at least one nozzle (16) to said mold (32) except for said distal end of said at least one nozzle in contact with the mold (32);

said insulating means also including a sprue (20) forming a flow passage extending from and in fluid communication with said manifold (12) for facilitating the introduction of plastic injection molding material into said manifold (12) and a locating ring surrounding said sprue (20) and disposed between said sprue (20) and said support member (40) and forming no part of the flow passage in the sprue and being the only path for thermal energy from said sprue (20) to said support member (40).

4,964,796

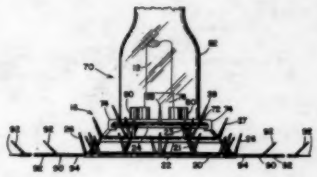
SWAG CENTERPIECE WITH TAPER CANDLE/CHIMNEY GLASS INSERT

Marian D. Sullivan, and Elaine A. Deelstra, both of Sioux Falls, S. Dak., assignors to Sullivan, Inc., Sioux Falls, S. Dak.

Continuation-in-part of Ser. No. 327,338, Mar. 22, 1989, Pat. No. 4,895,512, which is a continuation-in-part of Ser. No. 102,037, Sep. 29, 1987, Pat. No. 4,815,967. This application Jan. 23, 1990, Ser. No. 468,904

Int. Cl.[5] F23D *3/00*

U.S. Cl. 431—289 **13 Claims**



1. In a candle ring of the type including a plurality of tiered concentric ring members interconnected by spokes, the improvement comprising:

at least one runner extending radially outward from one of the ring members; and

a plurality of prongs on each of said runners for mounting decorations thereon in order to form a swag centerpiece.

4,964,797

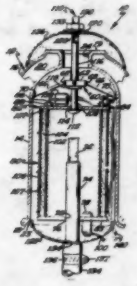
CATALYTIC HEATER FOR INTERNAL COMBUSTION ENGINES

Chester W. Hilton, 2133 Big Lake Rd., Cloquet, Minn. 55720

Filed Aug. 12, 1988, Ser. No. 231,364

Int. Cl.[5] F23D *14/18*

U.S. Cl. 431—328 **14 Claims**



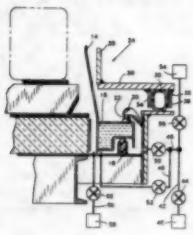
1. A heater for internal combustion engines comprising a jacket unit forming a central cavity having lower and upper openings, a catalytic burner unit, said catalytic burner unit including a cage comprising lower and upper plates and a plurality of threaded studs maintaining said plates in a vertically spaced relation, and means extending from said catalytic burner unit through said upper opening for suspending said burner unit within said cavity.

4,964,798

METHOD AND APPARATUS FOR QUICKLY PURGING ATMOSPHERE GAS FROM BELL FURNACE

Calvin C. Blackman, 5419 Park Dr., Vermilion, Ohio 44089

Division of Ser. No. 206,716, Jun. 15, 1988, Pat. No. 4,867,675.
This application Jun. 12, 1989, Ser. No. 351,198
Int. Cl.[5] F16K *1/00*; F27B *9/04*
U.S. Cl. 432—23 3 Claims



1. In a bell type heating furnace wherein a furnace base is provided to support material being annealed, and an inner cover is removably positionable over said material supported on said base, an outer furnace member is removably placeable over said inner cover, and means are provided to supply a gas atmosphere within said inner cover, the improvement comprising,

a vacuum shell unit seperate and independent from said outer furnace member removably positionable over said inner cover, said vacuum shell unit and said base having interacting sealing means to create a vacuum tight seal within said vacuum shell unit,

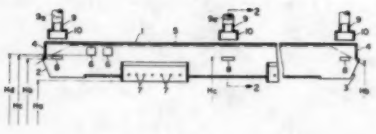
and means to create a vacuum within said vacuum shell unit including within said inner cover, whereby a vacuum can be established within said inner cover followed by flowing a gas atmosphere within said inner cover, and said vacuum shell unit can be removed and replaced by said outer furnace member around said inner cover, to heat the work.

4,964,799

HEATING FURNACES

Bunzo Hirano, 539, Nishinoshima, Toyoda-Cho, Iwata-Gun, Shizuoka-Ken, Japan

Continuation of Ser. No. 865,077, May 19, 1986, abandoned.
This application Mar. 4, 1988, Ser. No. 168,551
Int. Cl.[5] F27B *9/28, 7/00*
U.S. Cl. 432—59 8 Claims



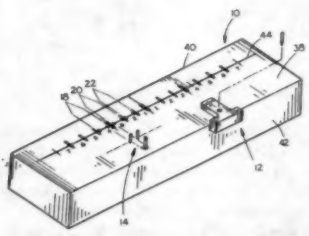
1. A horizontal-type furnace for heating articles, comprising: an elongate horizontal heating chamber; wherein the height of the upper edges of the inlet and outlet ports from a horizontal reference plane is Hb, the height of the upper edges of the exhaust ports from the horizontal reference plane is Hc, and the height of the bottom edges of the articles from the horizontal reference plane during their conveyance through the enclosed heating zone is Hd, the furnace being dimensioned to satisfy the relationships Hb, Hc Hd having top and bottom portions and a pair of opposed side wall portions, the heating chamber having an inlet port at one horizontal end portion thereof for admitting articles to be heated into the heating chamber and an outlet port at the other horizontal end portion thereof for discharging heated articles from the heating chamber; cover members secured to respective end portions of the heating chamber and depending downwardly from the heating chamber top portion to define the upper edges of the inlet and outlet ports, the cover members jointly defining together with the heating chamber top portion and the upper parts of the heating chamber side wall portions an enclosed heating zone within the heating chamber situated entirely above the level of the upper edges of the inlet and outlet ports; means for introducing hot gas into the heating chamber at a level below the enclosed heating zone whereby the hot gas ascends by natural convection and circulates within the enclosed heating zone; discharging means comprised of a set of exhaust ports formed in the heating chamber side wall portions for discharging the hot gas after the same has been cooled, the exhaust ports having upper edges situated no lower than the upper edges of the inlet and outlet ports whereby the cooled hot gas descends by natural convection and exits through the exhaust ports; and conveying means for conveying the articles from the inlet port to the outlet port through the enclosed heating zone while maintaining the bottom edges of the articles at a level no lower than the upper edges of the exhaust ports during conveyance of the articles through the enclosed heating zone of the heating chamber.

4,964,800

APPARATUS AND METHOD FOR BENDING DENTAL WIRE

Jackson J. Good, 501 N. 13 St., Norfolk, Nebr. 68701

Filed Mar. 24, 1989, Ser. No. 328,337
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—3 2 Claims



1. A method for precisely fitting dental wire to brackets affixed to a patient's teeth in order to reposition misaligned teeth, comprising the steps of:

measuring the width of those teeth to which the dental wire will be affixed;

plotting the width of the teeth, the desired spacing of the teeth, and the width of brackets to be placed on the teeth, along a straight baseline on a base block;

determining the type of biasing force necessary to reposition the misaligned teeth into an aligned position;

bending said dental wire into the appropriate shape to produce the determined biasing force, using the plotted measurements on said base block to determine the appropriate spacing of the bends;

mounting pins on said base block in the locations where said bending step will occur, the pins being mounted such that the dental wire may be bent therearound;

said bending step including bending the wire around said pins to form the appropriate shape in the wire;

providing a jig means with apertures therein located to provide a guide for a predetermined arrangement of said pins;

locating said jig means in those locations on the base block where the dental wire is to be bent;

said step of mounting said pins including the step of inserting

the pins through the apertures in said jig means and removing the jig means after mounting the pins; and

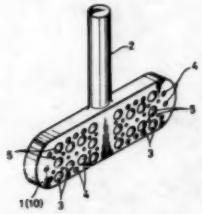
affixing the bent dental wire to brackets on the patient's teeth.

4,964,801

ENDOSSEOUS IMPLANT HAVING POLYCAPILLARY STRUCTURE

Haruyuki Kawahara, Moriguchi; Katsumi Tanaka, Ninomiya; Yasuyuki Ashiura, Odawara, and Motonobu Yoshimura, Samukawa, all of Japan, assignors to Haruyuki Kawahara, Osaka and Toho Titanium Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 931,661, Nov. 17, 1986, abandoned.
This application Oct. 20, 1989, Ser. No. 425,513
Claims priority, application Japan, Nov. 27, 1985, 60-264994
Int. Cl.[5] A61C *8/00*
U.S. Cl. 433—173 **12 Claims**



1. A method of forming a biological dynamic interface between an endosseous implant embedded in the living body and its ambient tissue, said method comprising:

preparing an endosseous implant including at least an embedding portion to be embedded in a living tissue, said embedding portion comprising any of a platelike body itself and a desired shape of body obtained by working the platelike body, said platelike body having orderly or disorderly a plurality of substantially straight tubular channels passing through a thickness of said platelike body for permitting the ingrowth and penetration of adjacent bone tissue therein, said tubular channels including at least two kinds of three different pore diameters of large, medium and small pore diameters for permitting the ingrowth and penetration of a bone tissue, osteoid tissue, and fibrous tissue, respectively wherein the tubular channels are formed by a process selected from the group consisting of an electrobeam process, laser beam process, electrospark machining method and mechanical drilling method and the distribution of said tubular channels is set depending upon the stress imparted to said embedding portion, said distribution being such that channels small in pore diameter correspond to high impact stress, channels medium in pore diameter correspond to medium impact stress, channels large in pore diameter correspond to low impact stress; and

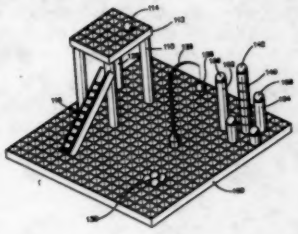
implanting said embedding portion in an endosseous area to allow the ingrowth and penetration of said at least two of the three kinds of tissues which pass through the thickness of said platelike body after the implantation to thereby build a polycapillary structure for said biological dynamic interface.

4,964,802

FREE CREATIVE AMUSEMENT APPARATUS

Emily C. Weller, 1300 Bear Mountain Ct., Boulder, Colo. 80303

Continuation of Ser. No. 158,234, Feb. 19, 1988, abandoned.
This application Jun. 8, 1989, Ser. No. 364,574
Int. Cl.[5] G09B *19/00*; A63H *33/06*
U.S. Cl. 434—96 **34 Claims**



1. An apparatus for building stationary three dimensional arrays of substantially spherical visual display elements, said apparatus comprising:

(a) a plurality of said substantially spherical visual display elements;

(b) a base defining recesses adapted to hold substantially without movement said visual display elements by gravity when placed upon said base; and,

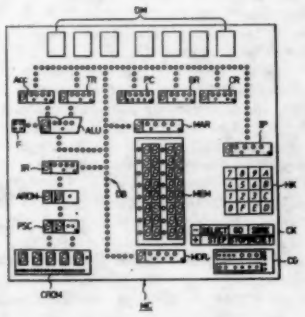
(c) a plurality of elongated support post each engageable with said base, each support post defining near its distal end a recess for supporting a said visual display element spaced from said base when said post is engaged with said base.

4,964,803

DEVICE FOR DISPLAYING OPERATION OF A MICROCOMPUTER AND METHOD OF DISPLAYING OPERATION THEREOF

Kim K. Chul, 11-1, Bukahhyun-Dong, Seodaemun-Ku, Seoul, Rep. of Korea

PCT No. PCT/KR88/00012, § 371 Date Feb. 27, 1989, § 102(e) Date Feb. 27, 1989, PCT Pub. No. WO88/10484, PCT Pub. Date Dec. 29, 1988
PCT Filed Jun. 24, 1988, Ser. No. 327,191
Claims priority, application Rep. of Korea, Jun. 26, 1987, 87-6531[U]
Int. Cl.[5] G09B *19/00*
U.S. Cl. 434—118 **13 Claims**



1. A device for visually displaying the operation of a microcomputer comprising:

an arithmetic display section, an accumulator display sec-

tion, a program counter display section, an instruction register display section, a T.B.C. register display section, a flag display section, an address read only memory display section, a presettable counter display section, a control read only memory display section, a memory display section, a memory address register display section, an input port display section and a clock generator display section for displaying a configuration of the microcomputer, each of said display sections being established divisionally on a front panel of a box-shaped training apparatus for simulating the operation of a microcomputer;

a hexadecimal keyboard and a control keyboard installed therein;

a data bus display unit connecting said display section; and

means for executing logic and arithmetic operations by orders for simulating the operation of a real microcomputer.

4,964,804

TRAINING KIT

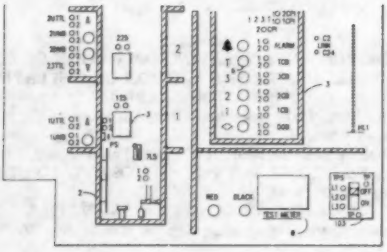
Thomas G. Carr, Falmer; Donald Oliver, Ortington; John James, Brighton, and Robert Rayfield, Kingswood, all of England, assignors to Otis Elevator Company, Farmington, Conn.

Filed Apr. 12, 1989, Ser. No. 337,010

Claims priority, application United Kingdom, Apr. 11, 1989, 8808446

Int. Cl.[5] G09B 9/00

U.S. Cl. 434—219 **3 Claims**



1. Apparatus, comprising:

a plurality of switches, responsive to manual actuation, for providing simulated condition signals;

a signal processor, responsive to said simulated condition signals, for providing an indicator signal for indicating said simulated conditions;

indicator means, responsive to said indicator signal, for providing a visual indication of said simulated condition;

said signal processor providing an interrogation signal;

a test probe, responsive to said interrogation signal, for providing said interrogation signal to a selected one of

a plurality of test points, for providing said interrogation signal from said selected test point;

said signal processor being responsive to said interrogation signal from said selected test point for providing a display signals; and

display means, responsive to said display signal for displaying a quantitative indication of said simulated condition;

wherein said signal processor, in response to said simulated condition signals, provides transition signals indicative of transitions between simulated states and provides said indicator and display signals according to said transition signals; and

wherein said simulated states comprise a closed loop of normal operating states from which transitions to abnormal operating states are made in response to said simulated condition signals.

4,964,805

MICROCOXIAL CONNECTOR HAVING BIPARTITE OUTER SHELL

Andrew J. Gabany, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 3, 1990, Ser. No. 460,437

Int. Cl.[5] H05K 1/00

U.S. Cl. 439—63 **7 Claims**

1. A coaxial electrical connector for printed circuit boards comprising:

an electrically conductive outer body adapted to rest upon the surface of a printed circuit board, and having electrically conductive ground legs supported by the body, the ground legs being a plurality of downwardly extending legs adapted to extend through apertures in the printed circuit board, to be electrically connected to conductive paths on the board; a center contact extending from within the body and having a first contact portion which is adapted to extend through an aperture in the printed circuit board to be electrically connected to a conductive path on the board, and a second contact portion which is adapted to mate with the center contact of a complementary coaxial connector; and a dielectric insulating body substantially surrounding said second contact portion;

wherein, the electrically conductive outer body is a bipartite body having a lower base substantially surrounding the first contact portion, and with an upper portion and an inner annular shoulder and an annular leading edge; and an upper electrically conductive outer shell, substantially surrounding the second contact portion, and with an extended outward annular flange captivated by press fit within the upper collar portion and the inner annular shoulder of the lower base; said annular leading edge of the lower base inwardly flared to captivate the flange of the shell between the said annular leading edge and the inner annular shoulder of the base.

4,964,806

SURFACE-MOUNTING CONNECTOR

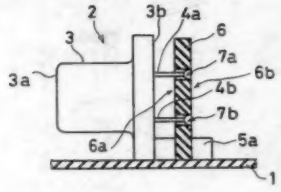
Yukio Sakamoto; Takeshi Tanabe; Iwao Fukutani, and Toshio Hori, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Continuation of Ser. No. 287,892, Dec. 21, 1988, abandoned. This application Mar. 20, 1990, Ser. No. 498,455

Claims priority, application Japan, Dec. 21, 1987, 62-194179[U]

Int. Cl.[5] H01R *9/09*

U.S. Cl. 439—79 **5 Claims**



1. A surface mounting-type connector, comprising:

a connector housing having an insertion portion on a front side thereof to which an insertion portion of a connector that is to be connected to said surface mounting-type connector is inserted; said bottom surface of said connector housing being adapted to be placed directly on a printed circuit board such that said connector housing is fixed on the printed circuit board;

a plurality of electrical-connector pins housed in said connector housing such that respective tip ends are projected from a rear of said connector housing, said connector housing having a bottom surface;

a connector-pin holder having predetermined construction extending downwardly to a bottom surface, a first main side spaced in confronting manner to a rear side of said connector housing, a second main side, and a plurality of through holes from said first to said second side; respective ones of said plurality of through holes corresponding in position to respective ones of said plurality of electrical-connector pins, said bottom surface disposed in substantially the same plane as said bottom surface of said connector housing and adapted to be placed directly on a printed circuit board;

a respective conductive pattern on at least one of said first and second sides of said connector-pin holder being electrically and mechanically fixedly connected to a circuit pattern on the printed circuit board; and

a plurality of conductive patterns formed in a predetermined relation to said through holes on a main surface of said connector-pin holder;

tip ends of said electrical-connector pins being respectively inserted into said through holes of said connector-pin holder and electrically connected to said conductive patterns;

said bottom surface of said connector housing and said connector-pin holder being free of depending projections for protruding through the printed circuit board; and

said connector-pin holder providing the sole electrically-conductive connections between said electrical-connector pins and the printed circuit board.

4,964,807

ELECTRICAL CONNECTOR AND DUAL PURPOSE TEST JACK

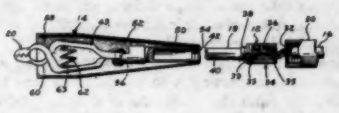
Thomas A. Draus, 2 Tabor Rd., Enfield, Conn. 06082

Filed Nov. 6, 1989, Ser. No. 432,152

Int. Cl.[5] H01R *11/24*

U.S. Cl. 439—169 **6 Claims**

1. Electrical connector and dual purpose test jack having a clamping member for connecting to a terminal post and a separable pin terminal assembly for "plug in" socket testing and adapted to be connected to a test meter comprising a cylindrical receptacle connected to the clamping member and



including an internally threaded portion, said pin terminal assembly including a cylindrical pin, dimensioned for longitudinal insertion with an interference fit within said receptacle including the threaded portion thereof.

4,964,808

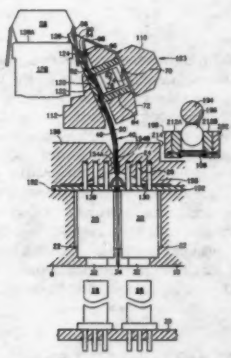
ELECTRICAL DEVICE CONTACTOR

Bernd Riechelmann, San Diego, Calif., assignor to Sym-Tek Systems, Inc., San Diego, Calif.

Division of Ser. No. 942,244, Dec. 16, 1986, Pat. No. 4,836,797. This application Apr. 24, 1989, Ser. No. 342,301

Int. Cl.[5] G01R *31/02*

U.S. Cl. 439—264 **8 Claims**



1. A contact leaf bank for an electrical contactor comprising:

(a) a uniform sheet of electrically conductive material,

(b) a plurality of elongated leaves of resiliently flexible electrically conductive material each having an end portion adapted to be a contact finger,

(c) a corresponding plurality of uniformly-spaced, elongated, parallel slots defined by the sheet in which the leaves are uniformly and centrally disposed, one leaf in each slot, the leaves being generally coplanar with the sheet except for a line of divergence between the sheet and the leaves proximate the contact fingers, and

(d) means securing the strips and the sheet in relation to each other.

4,964,809

ELECTRICAL TEST EQUIPMENT

Ian Jobson, Croxley Green, England, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 26, 1989, Ser. No. 412,695

Claims priority, application United Kingdom, Oct. 24, 1988, 8824831

Int. Cl.[5] H01R *13/627*

U.S. Cl. 439—357 **9 Claims**

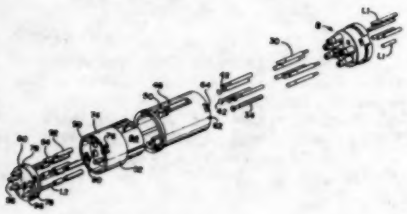
1. An electrical test probe assembly comprising;

an electrical test probe adaptor insulating housing formed with a plurality of through, first cavities each opening at

one end outwardly of a mating face of the adaptor housing;

an electrically conductive test probe barrel secured in each through cavity, each said test probe barrel having fixed therein a tube containing a slidably mounted, but captive, electrical test probe projecting outwardly of said mating face and being urged axially away therefrom by a spring contained within said barrel, said barrel having means for electrically connecting it to an electrical lead to extend outwardly from the other end of the through cavity in which the barrel is secured;

an electrical connector insulating housing formed with a



plurality of through second cavities each opening into first and second opposite mating faces of the connector housing which is matable with a mating electrical connector so that contact elements of the latter project towards, or into, respective ones of the second cavities; and

means for fixedly latching said adaptor and connector housings together with the mating face of the adaptor housing in aligned, face-to-face relationship with the first mating face of the connector housing, so that each test probe extends through, or into, a respective one of said second cavities for resilient engagement with a respective contact element of said mating electrical connector when it has been mated with said connector housing.

4,964,810

RETAINING BAR FOR PRINTED WIRING CARDS

Timothy P. Malotke, Lino Lakes; Glendon D. Kappel, Brooklyn Park, and Charles H. Marohl, Blaine, all of Minn., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 27, 1989, Ser. No. 457,624

Int. Cl.[5] H01R *13/639*

U.S. Cl. 439—368 **12 Claims**

1. An apparatus for retaining a plurality of printed wiring cards in operating positions within a card cage, comprising:

a bar member having a first and second ends along a longitudinal axis thereof;

a first latch fastened to the bar member at the first end;

said first latch is located along a first longitudinal edge of the bar member;

a second latch fastened to the bar member at the second end;

a second latch is located along a second longitudinal edge opposite to said first longitudinal edge of the bar member;

a resilient member attached to the bar member along the longitudinal axis thereof;

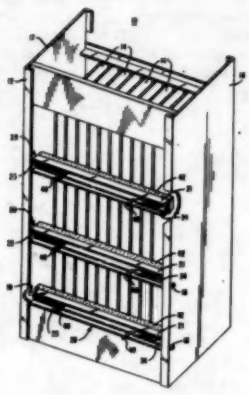
a card cage having a first and a second hole therein;

said first hole having a size selected to receive an end of said first latch, and having an axis that is transverse to the front edges of the printed wiring cards; and

said second hole having a size selected to receive an end of said second latch, and having an axis that is parallel to and has a vertically spaced relationship with the axis of the first hole;

said second hole is located on a portion of the card cage opposite to that of the first hole;

whereby with the end of the first latch inserted into the first hole and the end of the second latch inserted into the second hole, the bar member and the resilient member



attached thereto push against the edges of the printed wiring cards to retain the printed wiring cards in their operating positions in the card cage.

4,964,811

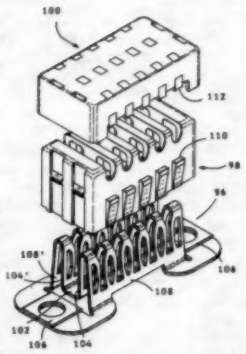
ELECTRICAL JUNCTION CONNECTOR HAVING WIRE-RECEIVING SLOTS

Earl J. Hayes, Sr., Mechanicsburg, Pa.; Daniel L. Johnson, Kernersville, and Galen M. Martin, Greensboro, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 20, 1989, Ser. No. 366,870

Int. Cl.[5] H01R *4/24*

U.S. Cl. 439—398 **15 Claims**



1. A connector assembly including a stamped and formed sheet metal connecting device for commonly connecting a plurality of wires, the device being of the type having wire-receiving slots for the wires, the slots having opposed edges which contact the wires upon movement of the wires laterally of their axes and into the slots, the device comprising:

two rows of U-shaped members, each U-shaped member comprising a bight and first and second arms extending from the bight, the U-shaped member of each row being in spaced-apart aligned relationship, the first arms in each row being coplanar and the second arms of each row being coplanar, adjacent U-shaped members in each row having opposed edges which define the wire-receiving slots,

each row having first and second connecting sections which extend for the length of the row, the first and second arms of each U-shaped member having ends which re integral with the associated first and second connecting sections respectively, the first arms of corresponding U-shaped members in the two rows being opposed and proximate to each other, the second arms being remote from each other and facing outwardly in opposite direction,

two rows of U-shaped members being connected to each other by a web which extends from one of the connecting sections of one of the rows to the corresponding connecting section of the other row, and

a molded insulating housing body is provided for covering the connecting device, the insulating housing body having openings which are in registry with the wire-receiving slots thereby to permit movement of the wires into the slots, and

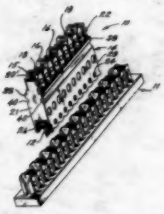
the molded insulating housing body comprising a plurality of E-shaped sections in aligned relationship in a row, each section having a central leg, outer legs on each side of the central leg, and a transverse back member from which the legs extend, the central legs being received between the first arms of corresponding U-shaped members, the outer legs extending beside the second arms of corresponding U-shaped members in the two rows, each E-shaped section being in covering relationship with a pair of corresponding U-shaped members, the E-shaped sections being spaced-apart thereby to provide the openings which are in registry with the slots, the central legs having outer ends which are integral with a continuous central frame member which extends for the length of the device between the ends thereof.

4,964,812

WIRE TERMINATION BLOCK

John A. Siemon, Woodbury, and Brian Reed, New Hartford, both of Conn., assignors to The Siemon Company, Watertown, Conn.

Filed Nov. 21, 1989, Ser. No. 439,634
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—403 **14 Claims**



1. A connecting block for housing a plurality of insulation penetrating beam contacts, comprising:

a housing having first and second spaced apart sidewalls and opposed upper and lower ends;

a plurality of spaced apart insulation penetrating beam contacts in said housing extending between said upper and lower ends, each of said contacts having a first aperture therethrough;

a plurality of spaced openings through said second sidewalls of said housing, one each of said openings being aligned with one each of said apertures in said beam contacts; and

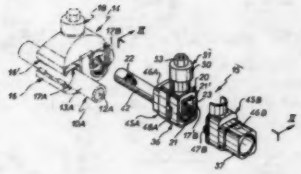
a plurality of spaced contact retention posts integrally molded to said first sidewall of said housing and extending laterally from said first sidewall, one each of said posts being mutually aligned with one each of said openings and one each of said apertures wherein said posts are forced under pressure to break away from said first sidewalls and are positioned through said apertures and openings to thereby retain said beam contacts within said housing.

4,964,813

BRANCH CONNECTION ACCESSORY DEVICE FOR AN INSULATED BRANCH CABLE TO BE CONNECTED TO AN INSULATED MAIN CABLE

Pierre Francois, Limoges, and Michel H. M. F. Prodel, Arnac Pompadour, both of France, assignors to S.I.C.A.M.E. Societe Industrielle de Construction, Arnac Pompadour, France

Filed Aug. 16, 1989, Ser. No. 394,473
Claims priority, application France, Aug. 22, 1988, 88 11085
Int. Cl.[5] H01R *13/52*
U.S. Cl. 439—521 **21 Claims**



1. Branch connection accessory device for an insulated branch cable to be connected to an insulated main cable comprising a clamping system in two parts adapted to clamp said branch cable between said two parts at least a first of which is electrically conductive, an insulated conductor appendix factory-fitted, electrically connected and mechanically joined to said first part and adapted to be connected to a non-separate branch connector having two jaws, to one of which said appendix is connected and the other of which is connected to said main cable, an insulative seal enveloping said device, a hole in said seal providing access to said first part and a well in said seal in line with the other of said parts for operating said other part, whereby the device constitutes a sealed, insulative branch connection accessory device.

4,964,814

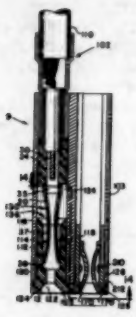
SHIELDED AND GROUNDED CONNECTOR SYSTEM FOR COAXIAL CABLES

John N. Tengler, Chico, Calif.; Alan L. Roath, and John T. Venaleck, both of Madison, Ohio, assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Continuation of Ser. No. 946,193, Dec. 23, 1986, abandoned, which is a continuation-in-part of Ser. No. 914,803, Oct. 3, 1986, Pat. No. 4,897,046. This application Apr. 24, 1989, Ser. No. 343,113
Int. Cl.[5] H01R *13/652*
U.S. Cl. 439—607 **48 Claims**

1. A coaxial cable termination system, comprising a coaxial cable terminator including a coaxial cable having signal and shield conductors and insulation separating said conductors, an electrical contact electrically connected to said signal conductor, said electrical contact having contacting means for electrically connecting with an external member inserted to engagement with respect thereto, and a strain relief for holding together said coaxial cable and electrical contact; electrically conductive housing means having a first opening for receiving therein from one end said terminator to hold the same in position to make electrical connection with an external member inserted into said housing means to engage said electrical contact; and insulator means having a tube-like portion insertable into said first opening in said housing means from the opposite end for covering at least a part of said contacting means of said electrical contact to insulate said contacting means from said housing means within said first opening, said

housing means having a second opening, and said insulator means including a front wall portion integral with said tube-like portion, said front wall portion overlying a surface of said



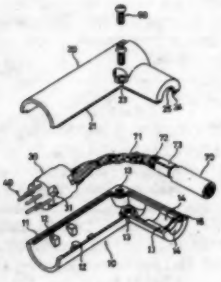
housing means at said opposite end and including first and second opening means for providing access from said opposite end to said first and second openings, respectively.

4,964,815

ELECTRICAL CONNECTOR

Mitsuru Kawai; Masaru Yoshida, and Yoshihiro Sasaki, all of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1989, Ser. No. 404,504
Claims priority, application Japan, Oct. 4, 1988, 63-129621
Int. Cl.[5] H01R *13/658*
U.S. Cl. 439—610 **8 Claims**



1. An electrical connector comprising:

an insulating housing containing a plurality of contacts and having a plurality of engaging recesses;

a cylindrical member for enclosing and supporting said insulating housing and consisting of first and second semi-cylindrical sections, said first semi-cylindrical section having a recessed joint edge and said second semicylindrical section having a projected joint edge to fit into said recessed joint edge when said two semi-cylindrical sections are jointed together, said cylindrical member having a plurality of engaging projections on a first end portion thereof for engagement with said engaging recesses of said insulating housing to restrict rotation and movement of said insulating housing with respect to said cylindrical member; and

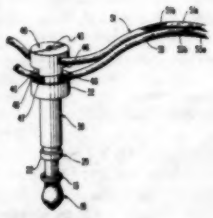
an insulating jacket molded around at least part of said cylindrical member and a terminated area of said cable.

4,964,816

ELECTRICAL CONNECTOR AND METHOD OF MAKING THE SAME

Greg R. Miller, Roanoke, Va., assignor to Plastics One, Inc., Roanoke, Va.

Filed Feb. 20, 1990, Ser. No. 481,181
Int. Cl.[5] H01R *17/18*
U.S. Cl. 439—669 **22 Claims**



1. A method of making an electrical connector comprising the steps of:

providing a plug having a first electrically conductive member slidably positioned in a second dielectric member which is slidably positioned in a third electrically conductive member having a fourth dielectric member slidably positioned therein and slidably positioned over said first conductive member;

placing a first conductive lead between said first and fourth members and a second conductive lead between said third and fourth members;

coupling said first conductive lead to said first member and said second conductive lead to said third member by displacing said fourth member relative to said first and third members to force said first and third members into said leads; and

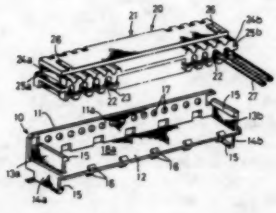
maintaining said first and second leads electrically isolated.

4,964,817

CONNECTOR HOLDER

Hirosumi Kanai, Kawasaki, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 13, 1989, Ser. No. 450,353
Claims priority, application Japan, Feb. 11, 1989, 1-14977[U]
Int. Cl.[5] H01R *13/436*
U.S. Cl. 439—701 **2 Claims**



1. An electrical connector holder for holding electrical connectors having electrical contacts secured in dielectric housings, comprising:

a front wall;

a center wall extending along the length of said front wall;

end walls extending outwardly from each surface of said center wall adjacent each end of said center wall;

first latch means on said end walls for latchably engaging the ends of electrical connectors when the connectors are

positioned along each said surface of said center wall and the front wall between the ends walls;

second latch means on said center wall for engaging the connectors to maintain the front surfaces of the connectors against the front wall; and

said front wall having apertures of the same pitch as the contacts in the connectors.

4,964,818

ELECTRICAL SOCKET

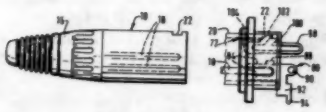
Richard M. Weatherley, Sunrise, Foxenden Lane, Meopham, Kent, United Kingdom DA13 0BP

Continuation of Ser. No. 95,170, Jul. 7, 1987, abandoned. This application Jul. 18, 1989, Ser. No. 383,228

Claims priority, application United Kingdom, Nov. 22, 1985, 8528748; Nov. 22, 1985, 8628010

Int. Cl.[5] H01R *13/42*

U.S. Cl. 439—751 **11 Claims**



1. An electrical socket for use with a connector comprising a body supporting on one face thereof one or more pins of predetermined size and disposition which in use are received in apertures in the socket, the socket comprises a body of plastics material having front and rear surfaces, a plurality of chambers each extending from said rear surface toward said front surface and communicating with said front surface by way of an individually associated aperture the diameter of which is less than the diameter of the chamber, a contact element supported in each said chamber in a position to engage and electrically contact a pin of a said connector for use with the socket passed thereto from said front surface and through said individually associated aperture, each said contact element being of resilient metal construction and comprising an elongate first part which is substantially flat and has edge portions, said first part of each said contact element being supported in said chamber in which it is located with at least one edge portion thereof received in a slot formed in a wall of the chamber to extend the length thereof from said rear surface, and wherein the depth of one of said slots extending over a part of its length forwardly from the rear surface of the body is of greater depth than the remainder of the length of said slot, the edge portion of the said first part of each contact element is formed with a tag which extends in the plane of said first part away from said edge portion and is received in said part of said at least one slot of said greater depth, and wherein said tag is twisted out of the plane of the said first part of said contact element such that edges of said tag bear against walls of said part of said at least one slot of said greater depth.

4,964,819

TERMINAL CONNECTOR CLAMP

Damian F. Caraballo, 1250 Chorus Way, Royal Palm Beach, Fla. 33411

Filed Aug. 15, 1989, Ser. No. 394,128

Int. Cl.[5] H01R *13/631*

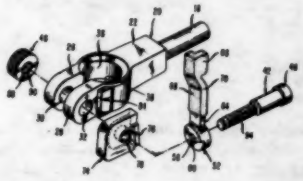
U.S. Cl. 439—773 **13 Claims**

1. A tool-free kit for closing terminal connector clamps of the type having opposing first and second terminal connector flanges, with aligned apertures in said flanges adapted for the reception of a fastener, said kit being adapted for retrofit application to said terminal connector clamps, said kit comprising:

a connecting shaft having a long axis adapted for placement through said aligned apertures of said connector flanges, said connecting shaft having a first end thereof, and a first stop member adapted to engage said first end of said connector shaft, said first stop member being adapted to engage an outside surface of said first connector flange, and being dimensioned to prevent removal of said connecting shaft through said aligned apertures, said connecting shaft having at a second end thereof a second stop member;

a lever member adapted to be connected to said second end of said connecting shaft so as to freely rotate about the long axis of said connecting shaft, and substantially abut said second stop member, said lever member having a first inclined surface;

a wedge member adapted to abut and engage said second connector flange and adapted to be substantially juxta-



posed to said lever member, said wedge member having a second inclined surface, said second inclined surface of said wedge member adapted to be substantially juxtaposed to said first inclined surface of said lever member, whereby rotation of the lever member about the connecting shaft, and through a throw path of about ninety degrees, will cause sliding contact between the first inclined surface of the lever member and the second inclined surface of the wedge member, and will cause axial movement of the wedge member along the axis of the connecting shaft, to force said second connector flange towards said first connector flange to close said terminal connector clamp.

4,964,820

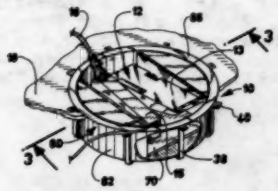
TROLLING MOTOR FOOT CONTROL MOUNTING SYSTEM

William L. Rayborn, 3300 Bugle Dr., Pine Bluff, Ark. 71603-8228

Filed Oct. 30, 1989, Ser. No. 429,034

Int. Cl.[5] B63H *25/02*

U.S. Cl. 440—7 **20 Claims**



14. A mounting system for a trolling motor foot control, said system adapted to be mounted within a predefined orifice in the boat deck and the system comprising:

bearing means extending about the periphery of said orifice;

a rotatable pan adapted to be concentrically disposed within said orifice, said pan having an interior adapted to receive said trolling motor foot control, and said pan comprising an outer, upper peripheral lip adapted to be disposed upon said bearing for rotation within said orifice, and said pan having a lower supporting surface recessed below said deck when said system is mounted; and,

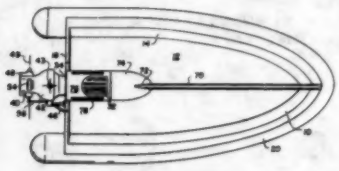
means for securing said foot control within said rotatable pan upon said lower recessed surface.

4,964,821

JET POWERED RIGID INFLATABLE BOAT WITH DEAD-MAN SWITCH

Craig Tafoya, Ft. Lauderdale, Fla., assignor to AutoBoat Corporation, Columbus, Ohio

Filed May 30, 1989, Ser. No. 357,888
Int. Cl.[5] B63B *7/08*
U.S. Cl. 440—38 **19 Claims**



1. In a boat having a rigid hull with a bottom wall, a pair of side walls connected to the bottom wall, each side wall including an upper edge and a rear edge, and the hull including a transom connected to the bottom wall and between the rear edges of the side walls, the boat including flexible pontoon means connected to the upper edges of the side walls, the improvement comprising:

water jet means mounted on the bottom wall near the transom and having an inlet for receiving water and an outlet for discharging water with force to propel the boat;

the bottom having a bottom surface and a first hole therethrough communicating with the inlet and the transom having a second hole therethrough communicating with the outlet;

water steering means connected to the transom over the second hole for steering water discharged through the outlet;

a keel connected to the bottom surface of the bottom wall near a front of the bottom wall, the bottom wall being flat and being free of the keel near the rear of the bottom wall in the vicinity of the first hole through the bottom wall and the inlet of the water jet means; and

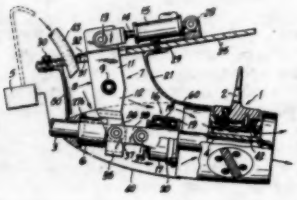
a pair of fins extending parallel to the keel, on opposite sides of the inlet at a location spaced rearwardly of the keel and substantially rearwardly of said first hole.

4,964,822

VARIABLE PITCH PROPELLER FOR WATERCRAFT

Peter Mueller, Widmerstrasse 27, Zurich, Switzerland

Continuation-in-part of Ser. No. 21,653, Mar. 14, 1987, abandoned, which is a continuation-in-part of Ser. No. 711,161, Mar. 13, 1985, Pat. No. 4,648,847. This application Jan. 11, 1989, Ser. No. 295,830
Int. Cl.[5] B63H *3/08*
U.S. Cl. 440—50 **11 Claims**



1. A watercraft, comprising:

a hull;

a single hollow support body secured below the hull;

a variable pitch propeller having a hub and a plurality of variable pitch propeller blades secured to said hub;

a propeller drive shaft disposed rotatably in said hollow support body with one end extending out of the body and adapted for connection to a driving engine;

a bearing provided at an inflow side of said propeller for said propeller shaft, said bearing being secured to said hollow support body, the shaft extending through the bearing;

adjustable elements mounted in the hub for varying the pitch of said blades;

said hub being connected to said drive shaft;

a coupling slidably disposed along the shaft in said hollow support body, said coupling having a rotatable first section secured to the propeller hub and a non-rotatable second section spaced from the shaft and having bearing means in which said first section is rotatably supported, the adjustable elements being secured to the first section, wherein movement of the second section back and forth along the shaft adjusts the pitch of the blades;

an adjusting rod linkage having an upper arm and a lower arm connected to said upper arm and secured to the second section for moving the second section;

remote means disposed in the watercraft remote from said hollow support body and being operatively connected to the adjusting rod linkage;

said single hollow support body being substantially L-shaped and having an arm connected to the hull and situated at the inflow side of said propeller, said support body accommodating and supporting said adjusting rod linkage, said bearing, said coupling, said adjusting elements and said hub;

and means for connecting said lower arm to the second section, said connecting means including a yoke provided at an end of said lower arm and a stirrup connected to said yoke by joints,

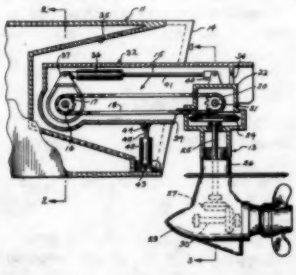
said stirrup having cover plates connected to said second section by further joints.

4,964,823

STERN DRIVE LIFT AND TRIM SYSTEM

Neil A. Newman, Omro; Herbert A. Bankstahl; John M. Griffiths, both of Fond du Lac; Lyle M. Forsgren, Oshkosh, and Wayne T. Beck, Fond du Lac, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Jan. 27, 1989, Ser. No. 303,568
Int. Cl.[5] B63H *5/12*
U.S. Cl. 440—61 **10 Claims**



1. In a marine drive apparatus for a boat including an engine mounted within the boat with its crankshaft disposed transversely with respect to the centerline of the boat, a stern drive unit disposed aft of the boat transom, and a power transmission linkage comprising a sprocket-driven belt operatively connecting the engine and the drive unit, an improved system for

selectively adjusting the lift and trim positions of the drive unit relative to the transom comprising:

a rigid lift arm supporting the power transmission linkage and the drive unit for generally vertical movement to a plurality of vertically spaced locations relative to the transom;

means mounting the drive unit to the lift arm for relative rotational movement therebetween;

power lift means interconnecting the boat and the lift arm for imparting the generally vertical movement;

power trim means interconnecting the boat and the drive unit for imparting the relative rotational movement while said lift arm is in any of said vertically spaced locations; and

wherein the lift arm is pivotally attached to the stern of the boat for rotation about the axis of the engine crankshaft.

4,964,824

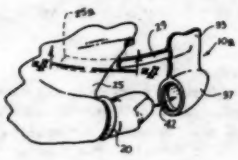
SWIMMING GLOVE

Kevin F. Spencer, and Bonnie L. Spencer, both of P.O. Box 3019, Stateline, Nev. 89449

Filed Jun. 5, 1989, Ser. No. 361,252

Int. Cl.[5] A63B *31/04*

U.S. Cl. 441—57 **2 Claims**



1. A webbed swimming glove comprising,

a plurality of finger sheaths defining a conduit for reception of individual fingers of a user, and

each of said finger sheaths extend forwardly of a hand portion, said hand portion including a back surface overlying and connected to a palm surface, and each of said finger sheaths terminating in an opening substantially equal to the cross-sectional area of a respective finger sheath, and

wherein said plurality of finger sheaths includes a first finger sheath, a second finger sheath, a third finger sheath, a fourth finger sheath, and a fifth finger sheath with a first connecting web formed between said first and second finger sheath, a second connecting web formed between said second and third finger sheath, a third connecting web secured between said third and fourth finger sheath, and a fourth connecting web secured between said fourth and fifth finger sheath, and wherein each of said connecting webs includes an inwardly extending tapered blind bore, and

wherein each finger sheath includes a cap member configured as a conically tapered enclosing cap to include a first cap and a second cap with a fifth connecting web therebetween, the second cap and a third cap include a sixth connecting web therebetween, and the third cap and a fourth cap include a seventh connecting web therebetween, and the fourth cap and fifth cap include an eighth connecting web therebetween, and each of the fifth, sixth, seventh, and eighth connecting webs including a respective alignment tab directed outwardly thereof with each respective alignment tab receivable within the blind bore of each of said connecting webs.

4,964,825

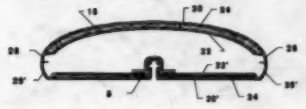
COMPOSITE AQUATIC BOARD AND MANUFACTURING METHOD

Claudio S. Paccoret, 2830 Instone Ct., Westlake Village, Calif. 91361, and Howard E. Crawford, III, 6450 Webster #395, Ventura, Calif. 93003

Filed Jul. 27, 1989, Ser. No. 385,657

Int. Cl.[5] A63C *15/00*

U.S. Cl. 441—74 **12 Claims**



1. An aquatic board comprising:

shaped upper and lower sections joined together to form a board with a generally hollow interior,

each section having a generally sandwich construction with a high strength outer skin, an inner skin spaced inwardly from the outer skin, and a core formed from a filler material sandwiched between the inner and outer skins, and

a receiver for a board accessory such as a fin or a mast in at least one of said sections, said receiver comprising a main body portion having an outward facing receiver slot and extending inwardly into the generally hollow interior of the board, and a pair of opposed flanges extending transverse to the main body portion and lodged between the inner and outer skins, said flanges retaining the receiver in place between said inner and outer skins, said inner skin formed from a high strength material, and said outer skin having an opening aligned with said receiver slot.

4,964,826

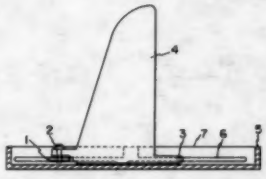
SAILBOARD FIN RETAINING MEMBER

Henry J. Lobe, 100 Archwood Ave., Annapolis, Md. 21401

Continuation-in-part of Ser. No. 146,612, Jan. 20, 1988, Pat. No. 4,846,745. This application Jun. 30, 1989, Ser. No. 373,460

Int. Cl.[5] A63C *15/05*

U.S. Cl. 441—79 **4 Claims**



1. An adjustable fin holder for securing a fin in a slot in the bottom of a sailboard or surfboard comprising:

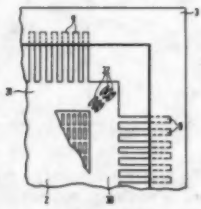
(a) a flexible means for clamping said fin to said board, a pair of grooves in said slot, said flexible means being retained in said grooves, said flexible means being no stronger than necessary to sustain the ordinary loads to which it is subjected; and

(b) all parts of said fin and said board being somewhat stronger than necessary to sustain ordinary loads, so that overloads resulting from an aftward blow to said fin will deform said flexible means, and leave said fin and said board undamaged, and permit the release of said flexible means from the grooves.

4,964,827
FLOATATION DEVICE FOR SWIMMERS
Isaac Rudy, 711 Avenue R, Brooklyn, N.Y. 11223
Continuation-in-part of Ser. No. 353,465, May 18, 1989, Pat. No. 4,936,806. This application Jun. 23, 1989, Ser. No. 370,641
Int. Cl.[5] A63B *31/12*
U.S. Cl. 441—59 2 Claims

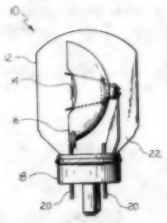
1. A floatation device for use by swimmers, including:
an inflatable tubular body having axially spaced ends which is attachable to a user's arm in encircling relation therewith, with a longitudinal axis of the tubular body extending longitudinally of the user's arm; and,
at least one lateral extension of said tubular body communicating with said body at a position intermediate said axial ends for inflation in unison therewith, said lateral extension extending radially outwardly of said body in a direction transverse to the longitudinal axis of said body.

4,964,828
METHOD OF MANUFACTURING A COLOR DISPLAY TUBE AND A COLOR DISPLAY TUBE
Paul J. Patt, Mt Kisco, N.Y., and Gerardus J. A. M. Notenboom, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 4, 1989, Ser. No. 389,724
Claims priority, application Netherlands, Aug. 4, 1988, 8801943
Int. Cl.[5] H01J *9/44*
U.S. Cl. 445—4 7 Claims



1. A method of manufacturing a colour display tube, the method comprising the steps of: (a) providing a display window with a display screen of phosphor elements luminescing in different colours; (b) suspending a tensed substantially rectangular shadow mask having a large number of apertures in the display window; and (c) securing an enveloping part to the display window, such that an envelope is formed; characterized in that after the envelope is formed the shadow mask and the display window are positioned relative to one another by locally deforming the tensed shadow mask by applying energy.

4,964,829
INTERNAL LAMP REFLECTOR
Arnold E. Westlund, Jr., Winchester; John M. Boyd, Nicholasville, and Raymond T. Fleming, Lexington, all of Ky., assignors to GTE Products Corporation, Danvers, Mass.
Division of Ser. No. 232,355, Aug. 15, 1988, Pat. No. 4,924,134. This application Mar. 3, 1989, Ser. No. 319,220
Int. Cl.[5] H01J *9/00*
U.S. Cl. 445—22 2 Claims

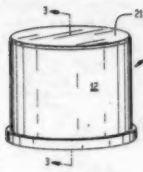


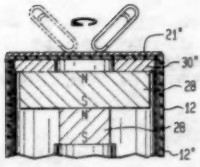
1. A method of making an improved internal reflector for use in a lamp envelope comprising the steps of:
(a) forming a reflector from a substantially pure aluminum by stamping a defined reflector shape from aluminum sheet,
(b) polishing the stamped reflector,
(c) etching the polished reflector to clean and enhance the reflective surface,
(d) rinsing the etched reflector,
(e) drying the rinsed reflector, and
(f) subsequent to drying the reflector, not chemically treating the reflector to leave vaporizable materials on the reflector, and not chemically treating the reflector to leave vaporizabie materials entrained in the reflector surface.

4,964,830
MAGNETIC DEVICE
Hans Wagner, 25 Woodale La., Santa Barbara, Calif. 93103
Filed Nov. 30, 1989, Ser. No. 443,452
Int. Cl.[5] A63H *33/26*; H01F *7/20*
U.S. Cl. 446—71 20 Claims

1. A magnetic device that may be used for storing and dispensing articles, and may be used as an amusement device or toy, comprising:
a main housing made of nonmagnetizable material having a hollow interior;
at least one bar magnet mounted in said interior of said main housing, said bar magnet having a thickness, length and width, a north pole, and a south pole; said bar magnet further comprising an upper surface and a lower surface, said south pole being situated at one of said upper and lower surfaces, and said north pole being situated at the other of said upper and lower surfaces;
said main housing comprising an upper support surface spaced from the upper surface of said bar magnet; said upper and lower surfaces of said bar magnet being related to each other such that said upper surface of said bar magnet lies closer to said upper support surface of said main housing than said lower surface of said bar magnet;
a spacer element made of magnetizable material mounted in said housing between said upper surface of said bar magnet and said upper support surface of said main housing for spacing said bar magnet from said upper support surface; said spacer element having a through-opening formed therein;
said upper support surface of said main housing defining a surface area thereof in alignment with and juxtapositioned

over said through-opening of said spacer element, whereby a magnetizable item may be caused to stand on





end and caused to gyrate for an extended period of time after initial impulse-momenta are applied thereto.

4,964,831

COLLECTOR EDITION DOLL

Gustave F. Wolff, 3213 Hobcaw La., Lexington, Ky. 40502

Filed Jan. 16, 1990, Ser. No. 465,888

Int. Cl.[5] A63H *33/04, 3/00*; B32B *27/42*

U.S. Cl. 446—75 **7 Claims**

1. A collector edition doll, comprising:
an outer casing including a painted face;
a doll received in said casing;
a story sheet received within said casing and detailing events in the life of said doll; and
pedestal means that may be received within said casing or alternatively used to support said casing.

4,964,832

MODULAR PUPPET SYSTEM

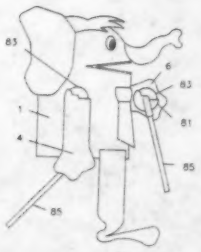
Charles Bickoff, 7 St. Andrews Dr., Avon, Conn. 06001

Filed Jul. 27, 1989, Ser. No. 385,827

Int. Cl.[5] A63H *3/16, 3/14, 3/02*

U.S. Cl. 446—100 **8 Claims**

1. A modular hand puppet non-destructively convertible into different characters and forms of operation, comprising a three dimensional unitized head with a mouth and a body; an outer surface of said unitized head, mouth surface, and body comprises a loop type fabric for the purpose of placing a plurality of detachable facial features, flexible body extremities, clothing and accessories anywhere on said loop surface; the body being a unitized structure including a cavity into the head for receiving a hand to support the puppet and operate the mouth which has an upper surface and an opposing lower surface to both consist of a loop type fabric capable of engaging a plurality of attachable features and accessories; said features, clothing, and accessories to have a permanently attached hook type fastener for engagement anywhere with the



loop type surfaces of the body, mouth, head, and extremites; said flexible body extremities to have at least one loop type fabric surface to releasably attach a pivoted fastener element between the flexible body extremity and the body; said pivoted fastener element comprises two plates with an axle pivotally attaching each plate to the other and each plate further including a hook type material; said loop type surfaces of the body, flexible body extremities, and accessories to allow a multiplicity of removals and attachments to said loop surfaces without destruction of said loop type surface; said loop type surfaces on the body, flexible extremities, and other elements to be receptive to the attachment of a control device.

4,964,833

TOY CONSTRUCTION BLOCKS WITH CONNECTORS

Toshio Suzuki, Tokyo, Japan, assignor to Mass-Set Kabushiki Kaisha, Japan

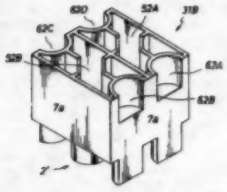
Filed Jun. 2, 1989, Ser. No. 360,606

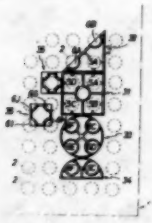
Int. Cl.[5] A63H *33/08, 33/06*

U.S. Cl. 446—118 **21 Claims**

1. A toy construction block set, comprising:
a base plate with a plurality of interlocking circular plugs having a concentric outside surface, said plugs being uniformly spaced on a top surface of the base plate;
a plurality of unit blocks in the shape of a square, a triangle, a circle, a one-half circle, and a one-fourth square having a top surface area one fourth that of said square, said unit blocks each provided with a horizontally disposed top planar surface, a peripheral side-wall extending perpendicularly from said top planar surface and having an upper edge conterminous therewith, and a bottom base circumscribed by a lower edge of said peripheral side-wall, said unit blocks each having at least one interlocking receptacle in the bottom base, whereby some of said unit blocks have a concentric rib receptacle comprising a plurality of concentrically spaced ribs for interconnection with said interlocking circular plugs so that the outside surface of the plugs is entirely enclosed within the peripheral side-wall of the unit blocks when the interlocking circular plugs are interconnected, and some of said unit blocks have a circular arc receptacle comprising a circular arc inner surface for interlocking with the outside surface of said interlocking circular plugs, said circular arc inner

surface converging on said peripheral side-wall of the unit block and contiguous therewith so that an interconnected circular plug extends outward past said peripheral side-





wall and outside the unit block, and others of said unit blocks have said concentric rib receptacle and said circular arc receptacle.

4,964,834

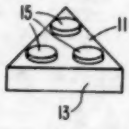
TRIANGLE BASED INTERCONNECTING BLOCK SET

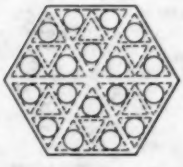
Rolf Myller, 1165 Fifth Ave., New York, N.Y. 10029

Filed Feb. 5, 1987, Ser. No. 11,027

Int. Cl.[5] A63H *33/08*

U.S. Cl. 446—118 **12 Claims**





1. A block set comprising a plurality of blocks each having a top side, a bottom side and a side surface extending between said top and bottom side, at least one projecting means extending from the top side of each of said blocks and receiving means on the bottom side of each of said blocks to receive a projecting means extending from the top side of another one of said blocks to interconnect and hold together a pair of said blocks in predetermined alignments, a subset of blocks each having the shape of a geometric figure consisting of a plurality of contiguous, congruent, equilateral triangles when viewed in a sectional plane perpendicular to said side surface, said projecting means and said receiving means being arranged so that the blocks of said subset can be interconnected with only one of the contiguous equilateral triangles in each block of an interconnected pair of blocks, overlapping and held in fixed alignment by said projecting means and said receiving means.

4,964,835

AIR CUSHION VEHICLE TOY

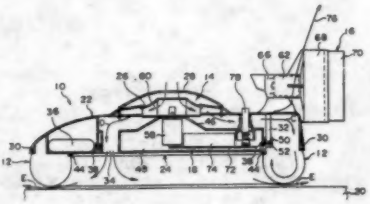
Shohei Suto, Tokyo, Japan, assignor to Taiyo Kogyo Co. Ltd., Tokyo, Japan

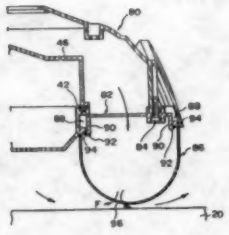
Filed Nov. 22, 1989, Ser. No. 440,610

Claims priority, application Japan, Jan. 31, 1989, 1-9306[U]; Jun. 13, 1989, 1-68170[U];

Int. Cl.[5] A63H *23/04, 29/16, 17/00*; B60V *1/06*

U.S. Cl. 446—154 **19 Claims**





1. An air cushion vehicle toy, comprising:

a body containing a float unit and a battery compartment;

said body having an air inlet and a plurality of downwardly directed discharge air vents;

a bag-like hollow skirt extending downwardly from below said body around an outer periphery thereof;

a centrifugal air blower disposed in communication with said air inlet and connected to discharge air into said baglike skirt to expand the latter and to discharge air through said air vents to provide levitation;

propulsive air blowers mounted on said body;

control means for supplying electric power from said battery compartment to each of said air blowers and for controlling operation of each of said air blowers separately;

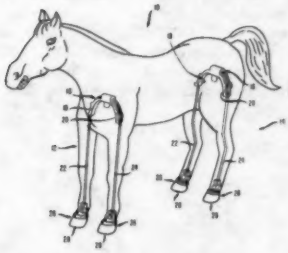
said float unit comprising a sealed box containing air and also containing electrical components; and

said centrifugal air blower being driven by an electric motor which is housed in said sealed box, a drive shaft of said motor extending upwardly through a top of said sealed box.

4,964,836
POSEABLE TOY ANIMAL

Masato Kamei, Tokyo, Japan, assignor to Bandai America Incorporated, Cerritos, Calif.

Filed Jan. 22, 1990, Ser. No. 467,960
Int. Cl.[5] A63H *3/04, 3/02, 3/46*
U.S. Cl. 446—374 **7 Claims**



1. A poseable toy animal including at least a first pair of flexible limbs, comprising:

(a) skeletal-like structure including:

(i) a generally inverted U-shaped frame including two downwardly extending support members; and

(ii) a pair of longitudinally extending flexible members each extending a first predetermined distance downwardly along, and a second predetermined distance downwardly from, one of said downwardly extending support members, said flexible members having lower portions;

(b) a body of flexible material in the shape of said animal formed in part around said inverted U-shaped frame, said two downwardly extending support members and said pair of longitudinally extending flexible members including said lower portions, the part of said flexible material formed around said lower portions of said pair of longitudinally extending flexible members and said lower portions of said pair of longitudinally extending flexible members substantially comprising said first pair of flexible limbs of said animal;

(c) said pair of said flexible material formed around said lower portions of said pair of longitudinally extending flexible members and said lower portions of said pair of longitudinally extending flexible members bendable into different shapes to provide said animal with different poses; and

each of said downwardly extending support members having an outer portion provided with a plurality of generally opposed and longitudinally spaced apart outwardly extending members forming generally a channel therebetween for receiving one of said longitudinally extending flexible members.

4,964,837
RADIO CONTROLLED MODEL VEHICLE HAVING COORDINATED SOUND EFFECTS SYSTEM

Harry B. Collier, 1356 E. Goldsmith Dr., Highlands Ranch, Colo. 80126

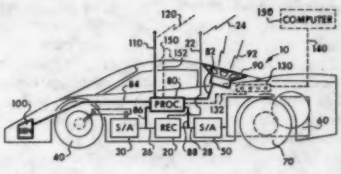
Filed Feb. 16, 1989, Ser. No. 312,063
Int. Cl.[5] A63H *5/00, 30/04, 33/22;* **G11B** *17/22*
U.S. Cl. 446—409 **38 Claims**

1. A self-contained sound effects system for a model radio controlled toy vehicle, said toy vehicle having a remote transmitter for transmitting radio signals to said toy vehicle, means on said toy vehicle receptive of said radio signals for providing one or a plurality of internal control signals for the operation of said toy vehicle, said self-contained system comprising:

means located in said toy vehicle and operatively connected to said providing means for detecting said internal control signals,

means located in said toy vehicle and connected to said detecting means for generating sound data coordinated with said detected internal control signals, said generating means comprising:

a. means for delivering sound data corresponding to a plurality of predetermined realistic sounds for said toy vehicle,



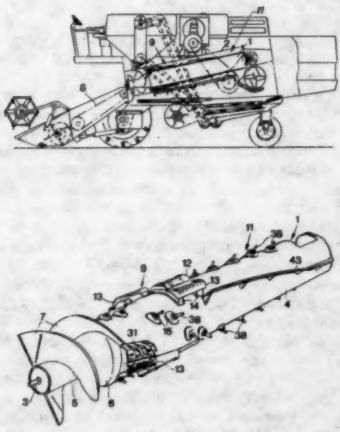
b. means receptive of said detected internal control signals through said detecting means and of said sound data from said sound data delivering means for outputting sound data coordinated with said detected internal control signals, and

means located in said toy vehicle and receptive of said outputted sound data from said generating means for producing a realistic sound corresponding to said sound data.

4,964,838
LOW PROFILE MOUNTS FOR AXIAL FLOW COMBINE ROTOR

Eric L. A. Cromheecke, Bredene, and Russell W. Strong, Brugge, both of Belgium, assignors to Ford New Holland, Inc., New Holland, Pa.

Filed May 5, 1989, Ser. No. 348,351
Claims priority, application United Kingdom, May 6, 1988, 8810759
Int. Cl.[5] A01F *7/06*
U.S. Cl. 460—66 **12 Claims**



1. In an axial flow harvesting machine having at least one generally cylindrical rotor rotatably mounted within a casing and operable, in conjunction with the casing, to thresh and separate grain from crop material, said rotor having an outer periphery and a plurality of mounting means permanently

affixed to said rotor at predetermined positions over the periphery of the rotor for connection thereto of detachable crop operating members to effect said threshing and separating, each said crop operating member having a base portion and a harvesting portion integrally formed with said base portion and extending outwardly therefrom to define an operative height of said crop operating member, said base portion of each said crop operating member being secured against said mounting means when detachably connected thereto, the improvement comprising:

the height of each said mounting means extending outwardly from said outer periphery of said rotor is less than said operative height of said crop operating members mountable thereon for operation on the crop material in use of the machine, said crop operating members being in the form of rasp bars detachably connectable to said mounting means, each said rasp bar having a finned area including a base portion positioned in engagement with said mounting means and a plurality of upwardly extending rasps integrally formed with said base portion, each said rasp bar being detachably connected to said mounting means by a fastener having a head portion engageable with said base portion to retain said rasp bar against said mounting means, said base portion having a slot formed therein for receiving each said fastener head portion, each said head portion being recessed into said base portion below said rasps and positioned out of engagement with said crop material in flow communication with the outer surface of said rasps.

4,964,839

DRIVE SHAFT WITH A COUPLING ARRANGEMENT

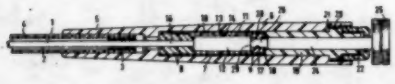
Peter Gloor, Tolfen, Switzerland, assignor to Rosy B. Versand GmbH, Mittenwald, Fed. Rep. of Germany

Filed Oct. 26, 1988, Ser. No. 262,711

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1987, 3736196; Nov. 26, 1987, 3740172

Int. Cl.[5] F16D *1/10*

U.S. Cl. 464—29 **6 Claims**



1. Drive shaft, connectable for driving purposes to a motor or geared motor, said drive shaft being made of flexible steel wire with a round profile, or flexible steel wire with several concentric layers of wire wound around a core made of flexible steel wire with a round profile and being disposed in a tube of synthetic material or coiled steel wire tightly bound thereabout and including a coupling element for attachment of said drive shaft to a tool-shaft of a symmetrically rotating tool provided with a head for milling, polishing or grinding purposes, a tubular housing (6) attached to said tube on the side away from said motor or geared motor, and cylindrical coupling element rotatably disposed in said housing, said drive shaft characterized by a permanent bar magnet (12) secured in the coupling element (7), the rear end of which is firmly attached centrically to the forward end of said drive shaft (1), said coupling element having a front end-face and a hole (17) having a cross-sectional shape compatible with said tool-shaft and in which said tool-shaft cannot turn in the middle thereof running longitudinally therein, and into which said tool-shaft (24) is disposed through an opening in the front of said housing (6), the end part (26) of said tool-shaft corresponding to the cross-sectional shape of said hole (17) and having a flat end-face, which, when in coupled position, sits flat on the smooth pole face (29) of said bar magnet which forms the base of said hole (17), the opening of said hole (17) in the coupling element (7) being funneled away from the edge of said opening, and a piece of piping (19) fitted in the front part of said housing which forms a positioning and guiding bushing for said tool-shaft (24).

4,964,840

UNIVERSAL COUPLING HAVING A RING INTERMEDIATE ELEMENT

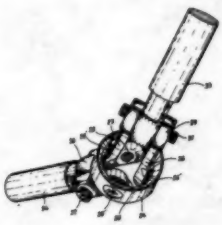
Hendrikus J. Kapaan, Nieuwegein, Netherlands, assignor to SKF Industrial Trading and Development Co. B.V., Nieuwegein, Netherlands

Continuation of Ser. No. 390,457, Aug. 4, 1989, abandoned, which is a continuation of Ser. No. 130,089, Dec. 8, 1987, abandoned. This application Feb. 1, 1990, Ser. No. 478,046

Claims priority, application Netherlands, Dec. 23, 1986, 8603282

Int. Cl.[5] F16D *3/42*

U.S. Cl. 464—125 **6 Claims**



1. In a steering control mechanism for a vehicle steering box connected to a steering wheel through a shaft and a coupling for coupling two generally shaft-shaped elements such that a rotational force can be transferred from one element to the other whereby the cardioids of these elements can form different angles with each other, an intermediate element, two swivelling coupling elements connected to said intermediate element, each of said two swivelling coupling elements having pivots being connected to said shaft and each of which has two opposing parts located on both sides of the cardioid of the swivelling coupling element which are connected to, and pivot around, the intermediate element, so that one of said swivelling coupling elements swivel in one plane and the other of said swivelling coupling elements swivel in a plane perpendicular to the first, with regard to the intermediate element, the improvement comprising: said intermediate element being annular, said opposing parts of each swivelling coupling element being connected to said annular intermediate element by two pivot pins located inside said annular intermediate element and projecting radially outward with regard to the cardioid of the pivot of said swivelling coupling elements, each of said pivot pins being carried on bearings in the annular intermediate element and capable of rotating around its cardioid, wherein each of said swivelling coupling elements comprises an extended arm having one end and means for holding said rods in an axially adjustable position wherein each pivot pin comprises a projection formed near the one end of the extended arm and perpendicular thereto, whereby the two extended arms running parallel at a distance to one another are held at their other ends by a separate holder means for holding said rods in an axially adjustable position.

4,964,841

CONTINUOUSLY VARIABLE TRANSMISSION

Mitsunao Takayama; Takeshi Nakazawa; Kozo Yamauchi, and Atsushi Asano, all of Nagoya, Japan, assignors to 501 Aichi Kikai Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 11, 1989, Ser. No. 378,084

Int. Cl.[5] F16H *11/02*

U.S. Cl. 474—11 **4 Claims**

1. A continuously variable transmission comprising:

a driving pulley and a driven pulley each having a stationary

half pulley which is provided with a conical surface and is fixed to a driving shaft or a driven shaft, and a moveable half pulley having a conical surface substantially the same with said conical surface of said stationary half pulley so as to form V groove between said stationary hair pulley,

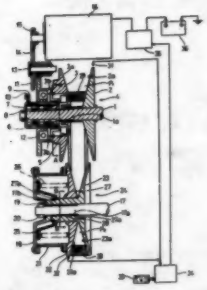
said moveable half pulley being slidably mounted to said driving shaft or said driven shaft so as to move away from and toward said stationary half pulley;

drive means for moving said moveable half pulley of said driving pulley or said driven pulley along said driving shaft;

an endless belt being passed between said driving pulley and said driven in engagement with each of said V grooves;

said drive means including a fixed slider shaft coaxially surrounding said driving shaft at the side opposite to said conical surface of said moveable half pulley and including a male thread on the outer surface thereof;

a slider mounted to said moveable half pulley through a bearing at the side opposite to said conical surface and including a female thread on the inner surface thereof for engagement with said male thread of said slider shaft;



a DC motor for rotation of said slider gear;

a control system for controlling said Dc motor;

said control system determining command gear ratio of said driving shaft to said driven shaft through a data map based on the automobile speed and the throttle valve opening position of an automobile engine detected by corresponding sensors, calculating actual gear ratio of said driving shaft to said driven shaft from their actual rotating speed, calculating the difference between said actual gear ratio and said command gear ratio, and determining appropriate voltage to be applied to said DC motor through said data map based on said difference of ratio; whereby said DC motor rotates at the speed corresponding to said determined voltage, said slider moves in the axial direction on said slider shaft at an appropriate speed, and consequently, said moveable half pulley moves also at the appropriate speed away from and toward said stationary half pulley, so that an effective tension does not act on said endless belt.

4,964,842

TWO PIECE POWER TRANSMISSION COMPONENT

Billy G. Howard, Arlington, Tex., assignor to Martin Sprocket and Gear

Continuation of Ser. No. 235,104, Aug. 23, 1988, abandoned. This application Aug. 10, 1989, Ser. No. 393,055

Int. Cl.[5] F16H *55/30*

U.S. Cl. 474—152 **3 Claims**

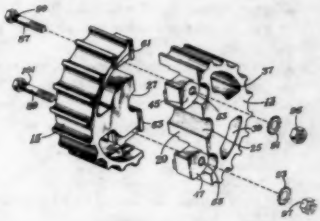
1. A two piece power transmission component manufactured in segments for convenient assembly around a shaft near the surface of a machine, comprising:

a first segment and second segment of selected thickness;

the two segments forming when mated a continuous toothed power transmission component outer periphery;

a transverse web extending across each segment to form a central, shaft receving opening;

a pair of fastener flanges, having a thickness less than that of the associated segments, extending outwardly from the transverse web of each segment between the central opening and the outer periphery, each flange having a planar



surface and at least one transverse surface to overlap with a mating flange of an opposed segment to axially and transversely align the segments;

each flange having a tapered axially extending locking ridge that mates with a mating tapered locking depression on an opposed flange of the mating segment to pull the segments together and to prevent separation of the segments when assembled by hand to hold the assembly for installation of fasteners;

each flange having an axially extending fastener hole mating with a paired, similar hole in the opposed flange;

a fastener extending between each paired fastener hole.

4,964,843

POWER TRANSMISSION UNIT FOR VARIABLE-SPEED DRIVE OF MACHINERY

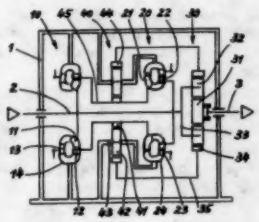
Georg Wahl, Crailsheim, Fed. Rep. of Germany, assignor to Voith Turbo GmbH & Co. KG, Crailsheim, Fed. Rep. of Germany

Filed Jul. 14, 1989, Ser. No. 381,125

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1988, 3823793

Int. Cl.[5] F16H *47/08*

U.S. Cl. 475—34 **11 Claims**



1. A power-transmission unit for variable speed drive of machinery, comprising:

an input shaft;

an output shaft coaxial with said input shaft;

a first fillable and dischargeable hydro-dynamic torque con-

verter having a turbine wheel and a pump wheel, said pump wheel being connected with said input shaft;

a braking device including a second hydro-dynamic torque converter having a turbine wheel and a pump wheel, the turbine wheel of said second torque converter being connected to said input shaft for rotation as a unit;

a differential gear arrangement having a first gear member connected with said input shaft, a second gear member permanently coupled to said output shaft, and a third gear member; and

coupling means for coupling said third gear member to the turbine wheel of said first torque converter and to said braking device, said coupling means including a gear transmission with constant ratio disposed between said differential gear arrangement and said first torque converter, and a shaft superposed on and arranged coaxially to said input shaft;

the pump wheel of said second torque converter being in continuous rotary connection with the turbine wheel of said first torque converter, and the turbine wheel of said second torque converter being in continuous rotary connection with the pump wheel of said first torque converter;

said gear transmission being a planetary gear arrangement having a ring gear connected to said third gear member of said differential gear arrangement and, establishing through the constant gear ratio, a connection to said superposed shaft.

4,964,844

GEARBOX ARRANGEMENT FOR DRIVING COAXIAL CONTRA ROTATING MULTI-BLADED ROTORS

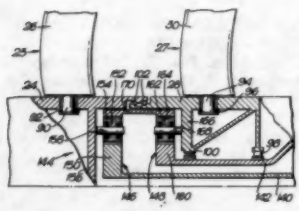
Adam Bagnall, Derby, England, assignor to Rolls-Royce plc, London, England

Continuation of Ser. No. 218,214, Jul. 13, 1988, abandoned. This application Nov. 2, 1989, Ser. No. 430,927

Claims priority, application United Kingdom, Sep. 5, 1987, 8720903

Int. Cl.[5] F16H *37/06*

U.S. Cl. 475—295 **6 Claims**



1. A gearbox arrangement for driving a first multi-bladed rotor and a coaxial second multi-bladed rotor in opposite rotational directions comprising a first epicylic gear and a coaxial second epicyclic gear,

the first epicyclic gear comprising a first sun gear, a plurality of first planet gears, a first annulus gear and a first carrier, the plurality of first planet gears meshing with the first sun gear, the first annulus gear meshing with the plurality of first planet gears, the plurality of first planet gears being rotatably mounted on the first carrier,

the second epicyclic gear comprising a second sun gear, a plurality of second planet gears, a second annulus gear and a second carrier, the plurality of second planet gears meshing with the second sun gear, the second annulus gear meshing with the plurality of second planet gears, the plurality of second planet gears being rotatably mounted on the second carrier,

a first input shaft being drivingly connected to the first epicyclic gear, a second fixed input shaft being connected to the second epicyclic gear, the second input shaft being static,

a first epicyclic gear being directly drivingly connected to the first multi-bladed rotor, the second epicyclic gear being directly drivingly connected to the second multi-bladed rotor, the first annulus gear of the first epicyclic gear being integrally formed with the second annulus gear of the second epicyclic gear whereby the first multi-bladed rotor and the second multi-bladed rotor are driven in opposite rotational directions.

4,964,845

MINERALS SEPARATOR

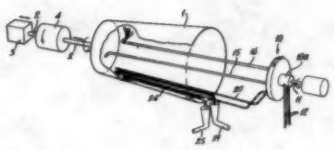
Richard H. Mozley, Falmouth, England, assignor to National Research Development Corporation, London, England

Division of Ser. No. 51,648, May 20, 1987, Pat. No. 4,799,920. This application Jan. 10, 1989, Ser. No. 295,346

Claims priority, application United Kingdom, May 22, 1986, 8612498

Int. Cl.[5] B04B *11/08*

U.S. Cl. 494—52 **4 Claims**



1. A centrifugal separator comprising:

a body having a centrifugal surface defining the inside of a cylinder and arranged to be rotated about the axis of said cylinder;

support means mounted within said cylinder for relative rotation between said support means and said cylinder about said axis;

scraper means carried by said support means and acting on said surface to move material thereon to be separated toward an end of said cylinder, said scraper means comprising a plurality of spaced scraper element inclined to the circumferential direction and overlapping axially of said cylinder; and

means for collecting separately fractions of the material from different locations spaced axially along said cylinder.

4,964,846

PROCESS FOR THE E/Z STEREOSELECTIVE SYNTHESIS OF HOMOCHIRAL FIVE AND SIX RING INTERMEDIATE PRODUCTS

Hans-Joachim Gais; Irene Erdelmeier, and Rolf Birk, all of Freiburg, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

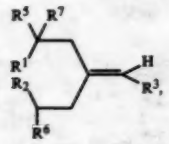
Continuation-in-part of Ser. No. 291,077, Nov. 16, 1988, abandoned. This application Nov. 21, 1988, Ser. No. 273,539

Claims priority, application Fed. Rep. of Germany, May 16, 1986, 3616850

Int. Cl.[5] C07D *317/72, 319/08*; C07C *145/02*

U.S. Cl. 549—336 **19 Claims**

1. A process for the production of an unsymmetrical olefin of formula I

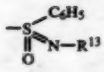


(I)

wherein

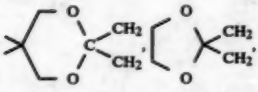
R^1 and R^2 are a common bond or the radical

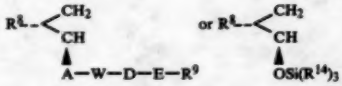
R^3 is the group



R^4 is a straight-chain or branched chain alkyl radical with 1–10 C atoms,

R^5 and R^6 are the same or different and are hydrogen, alkyl with 1–10 C atoms, cycloalkyl with 5–7 C atoms, alkoxy with 1–6 C atoms, aryl with 6–10 C atoms aralkyl with 7–12 C atoms or a 5–7 -membered heterocycle, which can contain another N, O or S atom, or, if R^1 and R^2 represent a common bond, R^5 and R^6 jointly are the radical





R^8 is hydrogen, alkyl with 1–10 C atoms or OR^{10}, wherein

R^{10} is hydrogen or a silyl, ether or acid radical,

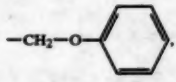
A is a trans—CH=CH— group or a —C≡C— group,

W is hydroxymethylene or a $-C(CH_3)(OH)-$ group,

D is an alkylene group with 1–5 C atoms,

E is a —C≡C— or —CH=CR^{11}— group,

R^9 is an alkyl group with 1–6 C atoms, or DER^9 together are a cycloalkyl group with 5–6 C atoms or the radical



R^{11} is alkyl with 1–4 C atoms,

R^7 is hydrogen or the radical $-(CH_2)_m-R^{12}$ or $-(CH_2)_{m-o}-(Z_1-(CH_2)_{m-p})_x-(Z_2-(CH_2)_{m-q})_y-R^{12}$,

R^{13} is alkyl with 1–4 C atoms or a tosyl radical,

R^{14} is alkyl with 1–4 C atoms, phenyl or benzyl,

m is 2–20,

o, p and q are positive integers each independently being less than or equal to 16,

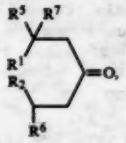
x and y are each independently 0, 1 or 2,

Z_1 is a cis—CH=CH— group, a trans—CH=CH— group or a —C≡C— group,

Z_2 is oxygen, sulfur, an NH-, an N-methyl or a —C≡C— group, and

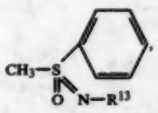
R^{12} is a free or protected amino, hydroxy, carboxy, mercapto or halogen,

comprising adding to a prochiral ketone of formula II



(II)

wherein R^1, R^2, R^5, R^6 and R^7 have the meanings indicated above, a lithiosulfoximine from a solution of n-butyllithium and an N-substituted S-methyl-S-phenyl-sulfoximine derivative of formula III



(III)

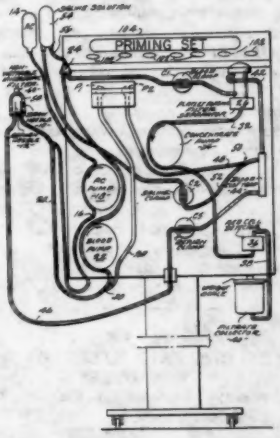
wherein R^{13} has the meaning already indicated, and then reacting the thus formed product with n-butyllithium and trimethylchlorosilane.

4,964,847

METHOD AND APPARATUS FOR ESTIMATING HEMATOCRIT IN A BLOOD CONSTITUENT PROCESSING SYSTEM

Paul R. Prince, Fountain Valley, Calif., assignor to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 920,341, Oct. 17, 1986, abandoned.
This application Dec. 23, 1988, Ser. No. 289,424
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—4 **8 Claims**



5. Apparatus for estimating the hematocrit of blood constituents in a blood constituent processing system, said system comprising:

means for performing an initial priming procedure within a fluid flow system including at least one blood flow needle primed with a predetermined fluid of known viscosity;

means for measuring the pressure drop across the orifice of said needle at a first flow rate using said fluid of known viscosity;

means for performing subsequent blood constituent processing operations;

means for measuring the pressure drops across said needle orifice for a second known flow rate of blood constituents;

means for determining a blood viscosity value as a function of the measured pressure drops and flow rates; and

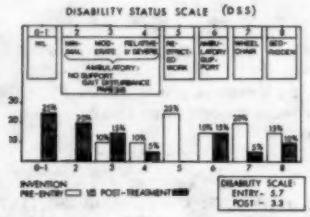
means for determining a hematocrit value for said blood constituents as a function of said blood viscosity value.

4,964,848

TREATMENT OF MULTIPLE SCLEROSIS WITH LYMPHOCYTAPHERESIS AND CHEMO-IMMUNOSUPPRESSION

Philip M. Bloom, 12508 Briarwood Ter., Minnetonka, Minn. 55343

Filed Jun. 27, 1988, Ser. No. 212,209
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—6 **8 Claims**



1. A method of treating demyelinating neuroimmunologic diseases in a human, comprising,

removing blood from the patient,

conducting lymphocytapheresis by separating and removing lymphocytes from the blood and returning the remaining fraction of the blood to the patient,

conducting said lymphocytapheresis in a series of separate treatment steps, each treatment step comprising at least about 5000 cc of plasma, sufficient to reduce the peripheral blood lymphocyte count to less than about 500 cells/μl,

administering an immunosuppressive or immunomodulating chemotherapeutic compound while continuing to administer said lymphocytapheresis steps at periodic intervals,

said immunosuppressive or immunomodulating compound being administered in an amount sufficient together with the lymphocytapheresis treatments to remove over 90×10^9 lymphocytes and to maintain the peripheral blood lymphocyte count at less than about 500 cells/μl such that the human subject is immunologically unresponsive by an amount sufficient to control the disease.

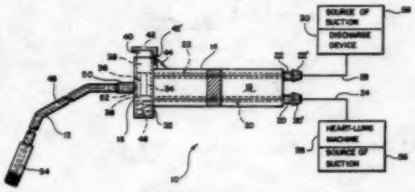
4,964,849

TWO-WAY SUCTION APPARATUS FOR SURGICAL PROCEDURES

Francis Robicsek, 1960 Randolph Rd., Charlotte, N.C. 28207

Filed Jan. 6, 1986, Ser. No. 816,562
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—35 **7 Claims**

1. A two-way suction apparatus for use in open heart surgical procedures and the like, comprising nozzle means adapted to be selectively manipulated and applied to a surgical area, exhaust means defining first and second parallel exhaust pathways communicating respectively with separate deposit locations, a source of suction applied to each of said first and second exhaust pathways, and two-way valve means intermediate said nozzle means and said exhaust means for selectively controlling communication between said nozzle means and one or the other of said first and second exhaust pathways for directing suction flow from said surgical area into and thorugh



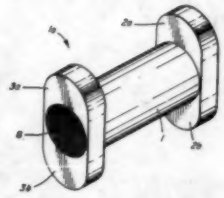
said nozzle means and the actively communicative one of said exhaust pathways to its respective deposit location.

4,964,850

METHOD FOR TREATING TRANS-NASAL SINUS AFFLICTIONS USING A DOUBLE T-SHAPED TRANS-NASAL AERATOR

Vincent Bouton, and Corine Bouton, both of 390 Avenue de Général Leclerc, Damarie Les Lys, France

Continuation of Ser. No. 116,451, Nov. 3, 1987, abandoned. This application Jun. 2, 1989, Ser. No. 361,729
Int. Cl.[5] A61M *31/00*
U.S. Cl. 604—54 **6 Claims**



1. A method for draining and ventilating maxillary sinuses in patients suffering from sub-acute or chronic affections, comprising the steps of:

perforating the bony wall separating a sinal cavity from a nasal passage to provide an opening in the bony wall;

providing a hollow drain tube made of flexible plastic material with flexible wings attached at each end, wherein said wings permit unidirectional passage of the tube through an opening to allow insertion of the hollow drain tube through the opening in the bony wall and to retard movement of the hollow drain tube once positioned in the bony wall;

inserting said hollow drain tube with positioning means until the wings on one end of said hollow drain tube pass through the perforated bony wall and into the sinal cavity;

deploying wings on the end within the sinal cavity thereby locking said hollow drain tube on the sinal cavity side on said bony wall; and

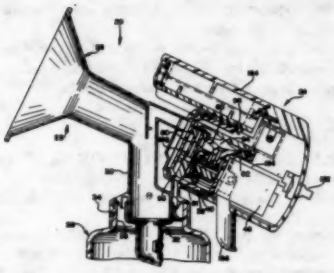
withdrawing the positioning means from the bony wall, said withdrawing liberating the wings in an open position to lock the hollow drain tube in place on the nasal passage side of the bony wall and provide a fixed draining and ventilating means between the sinal cavity and nasal cavity.

4,964,851

BATTERY-POWERED BREASTPUMP

Karl O. A. H. Larsson, Zug, Switzerland, assignor to ISG/AG, Zug, Switzerland

Filed Mar. 23, 1989, Ser. No. 328,106
Int. Cl.[5] B61M *1/06*
U.S. Cl. 604—74 **30 Claims**



1. A pump comprising:
(a) a suction bell;
(b) container means in fluid communication with said suction bell for receiving fluid from said suction bell;
(c) suction pump means in fluid communication with said suction bell and said container means for creating reduced pressures in said suction bell and said container means;
(d) rotatable valve means for interrupting said fluid communication of said suction pump means with said suction bell and said container means and for exposing said suction bell and said container in alternating fashion to said reduced pressures, and for exposing said suction bell to reduced pressure during the time when said container is atmospheric pressure, and for exposing said container to reduced pressure during the time said bell is at atmospheric pressure; and
(e) pressure-responsive valve means between said bell and said container that opens when said container pressure is lower than the pressure in said bell.

4,964,852

DOUCHE CONTAINER AND NOZZLE WITH INTERMEDIATE ONE-WAY VALVE

Walter B. Dunning, Pleasanton, Calif., and John P. Kinsley, Crystal Lake, Ill., assignors to Tambrands, Inc., Lake Success, N.Y.

Continuation-in-part of Ser. No. 256,043, Oct. 11, 1988, abandoned. This application Oct. 5, 1989, Ser. No. 415,936
Int. Cl.[5] A61M *1/06*
U.S. Cl. 604—75 **31 Claims**

20. A douche container and nozzle assembly comprising
a collapsible container which terminates in a neck;
a cup-shaped intermediate cap mounted on the neck, which cap has a flat top, a circumferential sealing bead adjacent said top, at least one outlet passage through said top and in flow communication with said container, and a retaining means;
a normally-flat flexible disk mounted on top of the cap by said retaining means, which disk overlies each cap outlet passage;
a nozzle with an internal passage having a base with an enlarged bore in communication therewith which together define a continuous axially-facing flat interior shoulder, said cap closely fitting within said bore with its top facing the interior shoulder and with its sealing bead engaging the walls of the nozzle base bore to give a sliding fluid-tight seal;
positioning means for retaining at least the top and sealing bead of said cap within the bore of said base and positively holding said cap either in a closed position with the cap top pressing the outer periphery of the disk against the interior shoulder so as to block flow of fluid through any cap outlet passages or in an open position under normal use conditions with said cap held with its top positioned

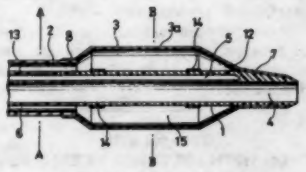
axially spaced from said shoulder sufficiently to permit fluid flow through at least one cap outlet passage and out past said disk while permitting manually overcoming said positive holding by axial displacement of said nozzle relative to said cap between said open and closed positions.

4,964,853

CATHETER EQUIPPED WITH EXPANSIBLE MEMBER

Yoshiaki Sugiyama, and Kyuta Sagae, both of Kanagawa, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00201, § 371 Date Oct. 26, 1989, § 102(e) Date Oct. 26, 1989, PCT Pub. No. WO88/06464, PCT Pub. Date Sep. 7, 1988
PCT Filed Feb. 25, 1988, Ser. No. 415,345
Claims priority, application Japan, Feb. 27, 1987, 62-46196
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—96 **2 Claims**



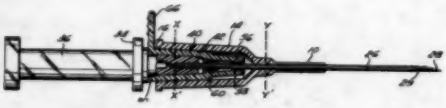
1. A catheter equipped with an expansible member comprising an inner tube having a first lumen whose tip is open and a second lumen extending to the tip direction of the first lumen; an outer tube disposed coaxially with said inner tube and having a tip at a position recessed by a predetermined distance from the tip of said inner tube and forming a third lumen between it and the outer surface of said inner tube; a contractible or foldable expansible member having a tip end portion and a base end portion, said base end portion being fitted to said outer tube and said tip end portion being fitted to said inner tube, said expansible member communicating with said second lumen near said tip end portion and with said third lumen near said base end portion; a first opening communicating with said first lumen and a second opening communicating with said second lumen each disposed at the base end portion of said inner tube; and a third opening disposed at the base end portion of said outer tube and communicating with said third lumen.

4,964,854

INTRAVASCULAR CATHETER ASSEMBLY INCORPORATING NEEDLE TIP SHIELDING CAP

Ronald B. Luther, Newport Beach, Calif., assignor to Luther Medical Products, Inc., Tustin, Calif.

Filed Jan. 23, 1989, Ser. No. 299,302
Int. Cl.[5] A61M *5/178*
U.S. Cl. 604—166 **10 Claims**



1. A catheter assembly comprising:

a tubular sheath having a proximal end, a distal end, and an inner lumen extending axially therethrough;

an elongate piercing member having a proximal end, a sharpened distal end, and an outer surface, said elongate piercing member being:

(a) initially deployable in an "assembled" position within the lumen of the tubular sheath such that the sharpened distal end of the elongate member extends beyond the distal end of the catheter sheath; and

(b) subsequently proximally withdrawable to a "retracted" position outside the lumen of said tubular sheath;

a shielding means initially incorporated within said catheter assembly, said shielding means being operative to attach to and shield the sharpened distal end of said elongate piercing member as said elongate piercing member is moved from its "assembled" position to its "retracted" position;

engagement means formed on the outer surface of said elongate piercing member; and

a catch means comprising a spring ferrule incorporated in said shielding means and configured to engage said engagement means;

said catch means being sized, configured, and positioned to interact with said engagement means as said elongate piercing member is moved from its "assembled" position to its "retracted" position; and

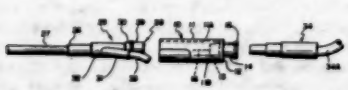
said interaction between said catch means and said engagement means being operative to facilitate attachment of said shielding means to the distal end of said elongate piercing member.

4,964,855

CONNECTOR WITH RECESSED NEEDLE FOR Y-TUBE, AND ASSEMBLY

Joseph J. Todd, 575 Stanford, Irvine, Calif. 92715; Earl F. Robinson, El Toro, and Rex O. Bare, Irvine, both of Calif., assignors to Joseph J. Todd, Tustin, Calif.

Filed Mar. 31, 1989, Ser. No. 331,245
Int. Cl.[5] A61M *39/00*
U.S. Cl. 604—283 **14 Claims**



1. A connector assembly for joining a Y-tube and a luer, the Y-tube including an attached sidearm, the assembly comprising:

a. a resilient, molded, tubular body providing an elongate sidewall and distal and proximal ports, the luer being connected to the distal port, and to an I.V. source, syringe, and the like, and the Y-tube being connected into the proximal port of the tubular body;

b. a recessed needle mounted within the distal port of the tubular body in liquid connection with the luer; and,

c. a cut-out area defined on the sidewall, and extending from the proximal port of the tubular body, the cut-out area including i. an alignment portion along which the tubular body slides as it deformably fits along the Y-tube and engages therewith, and ii. a notch area defined by the cut-out area; whereby,

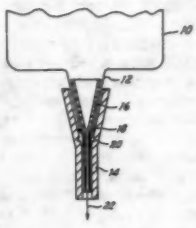
the tubular body and Y-tube are locked together by sliding the Y-tube along the alignment portion, and deforming the sidearm of the Y-tube into the notch area.

4,964,856

SECURING AN OUTLET PIPE OR TAP TO A LIQUID-CONTAINING BAG

Peter L. Steer, Surrey, England, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 203,845, Jun. 8, 1988, abandoned. This application Nov. 24, 1989, Ser. No. 440,488
Claims priority, application United Kingdom, Jun. 18, 1987, 87 14303
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—326 **1 Claim**



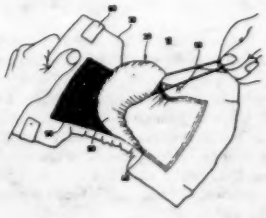
1. A bag for containing liquid including an outlet region trapped in a leakproof manner between a nested pair of members which are complementarily tapered, said nested pair of members comprising inner and outer funnel members having outwardly tapered portions and parallel portions, said bag outlet region being trapped between said inner and outer funnel members in the area of said outward tapers, said parallel portion of said outer funnel means extending below the parallel portion of said inner funnel means.

4,964,857

BIODEGRADABLE DISPOSABLE DIAPER

Charles Osborn, R.R. 4, Box 155, Waxahachie, Tex. 75165

Filed Oct. 23, 1989, Ser. No. 425,130
Int. Cl.[5] A61F *13/15*
U.S. Cl. 604—395 **15 Claims**



1. Improved biodegradable disposable diaper comprising:

a removable inner sheet having a layer of liquid permeable material, an interior first layer of absorbant material and a first layer of moisture repellant material;

a removal means attached to the inner sheet for easy removal of the inner sheet;

a second layer of absorbant material associated with the inner sheet;

a second layer of moisture repellant material associated with the second layer of absorbant material and extending beyond the inner sheet along both longitudinal and transverse planes;

a plurality of perforations in the inner sheet located at the peripheral coterminous points of the inner sheet and second layer of moisture repellant material; and

a plurality of fastening tabs attached to the second layer of moisture repellant material.

4,964,858

ORTHOPEDIC DIAPER DEVICE

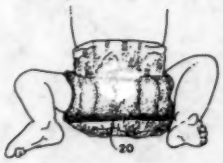
Michael Livay, Mevasseret, Israel, assignor to Advanced Computerized Systems Medical, Ltd., Jerusalem, Israel

Continuation-in-part of Ser. No. 188,632, May 2, 1988, abandoned, which is a continuation-in-part of Ser. No. 29,659, Mar. 24, 1987, abandoned. This application Jan. 4, 1989, Ser. No. 293,504

Claims priority, application Israel, Jan. 26, 1987, 81390

Int. Cl.[5] A61F *13/16*

U.S. Cl. 604—385.1 **20 Claims**



1. A diaper for infants comprising an absorbing layer, and an inflatable cushion for being positioned on the face of the diaper away from the infant's body, said cushion being non-water absorbent and being located, in the set-up position of the diaper, at the groin, between the thighs for supporting them in an abducted position.

4,964,859

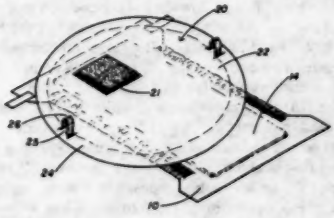
DIAPER WITH INTEGRAL CHANGING PAD AND DISPOSAL CONTAINER

Ruth L. Feldman, c/o Dr. Robert Plotkin, 28 Brenan Dr., Bryn Mawr, Pa. 19010

Filed Jul. 28, 1989, Ser. No. 386,572

Int. Cl.[5] A61F *13/16*

U.S. Cl. 604—385.1 **11 Claims**



1. A disposable diaper, changing pad, and disposal container, forming an integrated changing system for infants or incontinent adults comprising:

a disposable diaper having a skin contacting moisture absorbing inner surface and a waterproof environment interfacing outer surface;

a changing pad and disposal container means mounted to the outer surface of said diaper, and comprising a liquid impermeable membrane folded to define a closable pocket for retaining a towelette therein in the moistened state until such time as the towelette is needed for wiping the skin, and said pocket being adapted to expand and to be unfolded to form a changing pad for use while diapering and upon completion of the diapering process to be used as a disposal bag for said soiled diaper and the spent towlette; and

a moist towelette adapted to be stored within said changing pad and disposal container means.

4,964,860

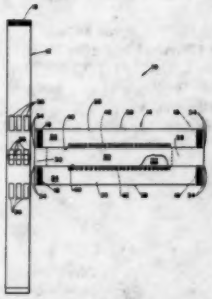
DETACHABLE TWO PIECE ABSORBENT GARMENT

William P. Gipson; Michael W. Mason, both of Cincinnati, and Thomas A. Hensler, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 18, 1990, Ser. No. 382,157

Int. Cl.[5] A61F *13/15*

U.S. Cl. 604—391 **18 Claims**



3. A garment having a front portion, a rear portion and a longitudinal centerline, said garment comprising:

a belt having a first face and a second face opposed thereto, said belt comprising receiving material and at least one patch of complementary hook type material adapted to be refastenably attached to said receiving material; and

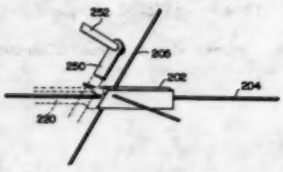
a disposable assembly comprising a liquid pervious topsheet, a liquid impervious backsheet joined to said topsheet, an absorbent core intermediate said topsheet and said backsheet, two longitudinally oriented flaps overlaying said topsheet, and an outwardly facing patch of complementary hook type material disposed on each of said flaps and adapted to be refastenably attached to said receiving material of said belt, said belt and said disposable assembly being detachable from each other.

4,964,861

INSTRUMENTATION FOR IMPLANTING PROSTHETIC DEVICES

John M. Agee, 77 Scripps Dr., #101, Sacramento, Calif. 95825, and Francis C. King, Sacramento, Calif., assignors to John M. Agee, Sacramento, Calif.

Filed Dec. 22, 1988, Ser. No. 289,013
Int. Cl.[5] A61B 17/00; A61F 2/30, 2/42
U.S. Cl. 606—87 **26 Claims**



20. A jig for facilitating orientation and implantation of a prosthesis in a metacarpophalangeal joint, said jig comprising:

(a) an elongated body member including a planar front face which is sloped in a manner such that it forms an angle in the range of about 20° to 40° relative to the longitudinal axis of said body member; wherein said body member further includes a longitudinal aperture therethrough parallel to said longitudinal axis;

(b) an elongated rod member slidably received in said longitudinal aperture and being longitudinally movable therein; and

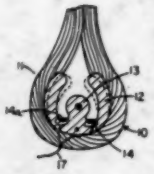
(c) horizontal orientation means carried by said body member for facilitating horizontal orientation thereof.

4,964,862

METHOD OF AND MEANS FOR MEASURING LIGAMENT TENSION

Steven W. Arms, Burlington, Vt., assignor to Micro Strain Company, Burlington, Vt.

Filed Aug. 31, 1989, Ser. No. 401,221
Int. Cl.[5] A61F 5/00, 2/08
U.S. Cl. 606—102 **5 Claims**



1. Means for measuring ligament tension, for use during surgical procedures for ligament replacement, comprising:

retaining means;

said retaining means comprising at least one looped flexible strand;

implantable receptacle means being enveloped within said retaining means;

said implantable receptacle means having a position aperture located therein;

said implantable receptacle means further having measurement means;

monitoring means for continuously measuring the ligament tension;

said monitoring means having flexible lead wire circuitry from said measuring means for (a) delivering excitation to said measuring means, and (b) conducting said signals from said measuring means to conditioning electronic means and to a continuous display of tension;

position setting means; and

said position setting means comprising a fixation pin placed through said position aperture located within said implantable receptacle means.

4,964,863

DEVICE FOR ESTABLISHING ESOPHAGOENTEROSTOMIES

Nikolai N. Kanshin; Viktor A. Lipatov, and Igor A. Guskov, all of Moscow, U.S.S.R., assignors to Moskovsky Gorodskoi Nauchno-Issledovatelsky Institut Skoroi Pomoschi Imeni N.V. Sklifosovskogo, Moscow, U.S.S.R.

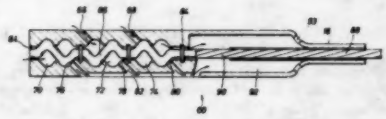
PCT No. PCT/SU88/00125, § 371 Date Feb. 9, 1989, § 102(e) Date Feb. 9, 1989, PCT Pub. No. WO88/09644, PCT Pub. Date Dec. 15, 1988
PCT Filed May 26, 1988, Ser. No. 328,032
Claims priority, application U.S.S.R., Jun. 10, 1987, 4303545
Int. Cl.[5] A63B 17/00
U.S. Cl. 606—153 **3 Claims**

1. A device for establishing esophagoenterostomies, comprising a hollow housing (1), an outer sleeve (2) and an inner sleeve (3) interconnected telescopically and communicating with the hollow housing, the inner sleeve (3) being extended from the outer one (2) to form an area adapted to mount an elastic ring (6), which compresses the biological tissues being joined together during anastomosis formation, each of said sleeves having an opening (4, 5) in the bottom thereof, through which the respective sleeve (2, 3) communicated with the hollow housing (1), a bushing (7) accommodated in one of the organs (9) to be anastomosed and having a first annular groove (11) on its outside surface for anastomosis formation by means of the elastic ring (6), and a probe (14) connected to the bushing (7) and passing through the interior spaces of the bushing (7), sleeves (2, 3) and hollow housing (1), characterized in that it incorporates a second bushing (8) having an annular groove (13) on its outside surface for securing thereon the end of the other organ (10) being anastomosed, while the first bushing (7) has a second annular groove (12) on its outside surface, adapted to secure the end of the first organ (9) being anastomosed, said first bushing resting upon a shoulder (16) made in the probe (1 4), which makes it possible, during anastomosis formation, to join the bushings (7, 8) together into a single unit, to put them inside the sleeves (2, 3) and, while moving the inner sleeve (3), to throw the elastic ring (6) off from the outside surface of the inner sleeve (3) in order to compress the organs (9, 10) being anastomosed in the first annular groove (11) of the first bushing (7), all the motions mentioned above being actuated by virtue of the probe travel.

4,964,864
HEART ASSIST PUMP

David P. Summers, and Jeddy D. Nixon, both of Houston, Tex., assignors to American Biomed, Inc., The Woodlands, Tex.

Filed Sep. 27, 1988, Ser. No. 249,830
Int. Cl.[5] A61M 1/10
U.S. Cl. 623—3 5 Claims



1. A temporary circulatory assist pump, comprising:

(a) an elongate, cylindrical biocompatible pump having at least one intake port and at least one discharge port, said pump being sized for passage through a human blood vessel and insertion in to a heart;

(b) said pump comprising a stator and a rotor whereby orbiting motion of the rotor moves a seal continuously through the stator for pumping of blood therethrough;

(c) wherein said stator and rotor define an axial cavity divided to form separate rotor cavities having separate outlet ports for discharging blood into a discharge duct in fluid communication with said separate rotor cavities;

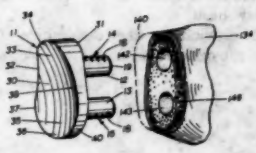
(d) extravascular power means connected to said pump for driving said rotor; and

(e) drive shaft means connecting said pump means to said power means, said drive shaft means being connected to said rotor by a flexible joint, said flexible joint permitting flexure deformation thereby enabling said rotor to move through an orbital path upon rotation of said rotor by said power means.

4,964,865
GLENOID PROSTHESIS AND METHOD OF USE

Wayne Z. Burkhead, Dallas; James L. Dale, Austin, and Brian D. Burkinshaw, Pflugerville, all of Tex., assignors to Intermedics Orthopedics, Inc., Austin, Tex.

Filed Feb. 3, 1988, Ser. No. 151,715
Int. Cl.[5] A61F 2/40
U.S. Cl. 623—19 17 Claims



1. A glenoid prosthesis providing fixed engagement with a flat resected surface on the scapula head, said prosthesis comprising:

a glenoid component having a lateral surface shaped to articulate with the humeral head;

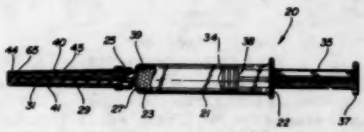
a flat medial surface for engaging a flat resected surface on the scapula head; and

a plurality of spaced posts protruding medially from the medial surface for insertion into the scapula head for fixedly attaching the glenoid component to the resected scapula head, said posts having transverse groves only on the outer faces of the posts, said grooves decreasing in depth going from the distal to the proximal ends of the posts.

4,964,866
NEEDLE SHEATH ASSEMBLY

Joseph M. Szwarc, Cedar Grove, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Nov. 22, 1989, Ser. No. 440,915
Int. Cl.[5] A61M 5/32
U.S. Cl. 604—192 27 Claims



1. A hypodermic syringe assembly comprising:

an elongate barrel having an open proximal end, a chamber for retaining fluid and a tip portion extending from a distal end of said barrel having a passageway therethrough communicating with said chamber;

a needle cannula having a distal end extending outwardly from said tip portion including a lumen therethrough in fluid communication with said passageway;

a needle shield assembly including a resilient needle sheath having an open proximal end, a closed distal end, a sidewall defining a receptacle therein, said resilient needle sheath being positioned within an elongate rigid needle shield having an open proximal end, a closed distal end and a sidewall therebetween;

means for holding said sheath within said shield so that said sheath cannot be removed from said shield during normal use of said syringe assembly,

said sheath including cannula sealing means at said distal end of said receptacle for providing a fluid-tight seal between said lumen and the environment of said syringe assembly;

said needle shield assembly being positioned with said distal end of said cannula engaging said cannula sealing means and said proximal end of said sheath removably engaging said tip portion to hold said shield assembly on said barrel while simultaneously sealing said lumen of said cannula so that said sheath surrounds the entire portion of said cannula which extends outwardly from said tip portion;

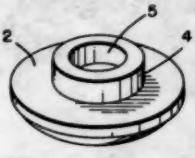
said shield and said sheath being structured so that said shield cannot be manually assembled to or manually separated from said sheath while said sheath is properly positioned sealing said cannula and engaging said tip portion of said barrel; and

said needle shield assembly being easily engageable to and removable from said barrel and said cannula using manual force applied to said shield.

4,964,867
PATELLAR PROSTHESIS

John W. Boger, Warsaw, Ind., assignor to Boehringer Mannheim Corp., Indianapolis, Ind.

Filed Feb. 3, 1989, Ser. No. 306,440
Int. Cl.[5] A61F 2/38
U.S. Cl. 623—20 3 Claims



1. A patellar prosthesis sized and shaped to be surgically

implanted on the resected bone structure of a patella comprising

a bone facing surface and a contoured surface opposite said bone facing surface;

a protuberance extending from the bone facing surface for attaching the implant to said resected bone surface,

the improvement characterized in that the protuberance comprises a concave shape.

4,964,868

KNEE PROSTHESIS

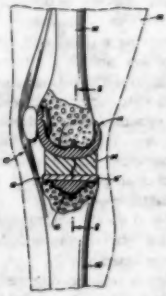
Roy D. Bloebaum, Phoenix, Ariz., assignor to Harrington Arthritis Research Center, Phoenix, Ariz.

Continuation of Ser. No. 759,453, Jul. 25, 1985, Pat. No. 4,714,473. This application Aug. 27, 1987, Ser. No. 89,865

The portion of the term of this patent subsequent to Dec. 22, 2004, has been disclaimed.

Int. Cl.[5] A61F *2/38*

U.S. Cl. 623—20 **2 Claims**



1. A prosthetic joint, comprising:

a femoral component having a base surface for biological ingrowth attachment to the femur of a patient;

a tibial component having a base surface for biological attachment to the tibia of a patient;

said base surfaces of said femoral and tibial components each being defined by a plurality of relatively shallow and relatively smooth channels subdividing said base surfaces into a plurality of attachment zones, said attachment zones including a selected porous biological ingrowth material;

said base surface of said tibial component being further defined by a relatively flat tibial tray cooperating with and substantially surrounding a central outwardly bulged and smoothly contoured protrusion of a generally bulbular shape, said tray and protrusion together providing an extended surface area for contacting and biological ingrowth attachment to the tibia of a patient; and

at least one anchoring fin member projecting downwardly from said base surface of said tibial component.

4,964,869

ASSEMBLY OF A CERAMIC HEAD ON A METAL ROD FOR A HIP PROSTHESIS

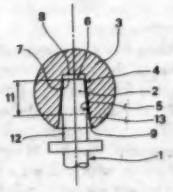
Michel Auclair, Bois d Arcy, and Christian Prats, Evreux, both of France, assignors to Ceramiques Techniques Desmarquest, Courbevoie, France

Filed Jun. 28, 1989, Ser. No. 372,753

Claims priority, application France, Jun. 28, 1988, 88 09042

Int. Cl.[5] A61F *2/36, 2/32*

U.S. Cl. 623—23 **9 Claims**



1. An assembly for use in combination with an acetabular cup for forming an internal prosthesis for a hip joint, said assembly comprising:

a ceramic head having extending from its outer surface a blind-ended recess in the shape, at least at the blind end of said recess, of a truncated cone of predetermined, small apex angle and dimensions; and

a peg formed at the end of a rod and inserted within said recess to a predetermined depth, said peg having at least a distal end formed in the shape of a truncated cone of apex angle corresponding to the apex angle of said recess, and dimensions such that said peg is nested in said recess in a deep contact zone located toward the center of said ceramic head, said deep contact zone being about 15% to 80% of the depth of insertion of the peg in the recess, a non-contact zone between the peg and the recess being located between said deep contact zone and the surface of said ceramic head;

said assembly providing optimal distribution of stresses from the peg to the ceramic head.

4,964,870

BLEACHING WITH PHENYLENE DIESTER PERACID PRECURSORS

Ronald A. Fong, Modesto, and Stephen B. Kong, Alameda, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation of Ser. No. 681,983, Dec. 14, 1984, abandoned. This application Jun. 8, 1989, Ser. No. 366,192

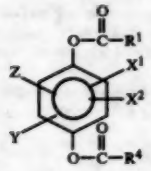
Int. Cl.[5] **D06L** *3/02;* **C11D** *3/395, 7/54*

U.S. Cl. 8—111 **22 Claims**

1. a bleaching composition comprising:

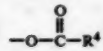
(a) a source of hydrogen peroxide; and

(b) a bleach effective amount of a peracid precursor of the general structure



wherein R^1 is either an alkyl or a halogen-substituted alkyl, of less than 5 carbon atoms; and X^1, X^2, Y and Z are individually selected from H, $SO^{-}{}_3$, $CO^{-}{}_2$, NO_2, $NR^{5+}{}_4$, Halogen, R^6, and mixtures thereof;

wherein R^4 of



is either an alkyl or a halogen-substituted alkyl, of about 5 to 11 carbon atoms; R^5 of $NR^{5+}{}_4$ is selected from H, alkyl of 1 to 24 carbon atoms and mixtures thereof; R^6 is alkyl of about 1 to 20 carbon atoms.

4,964,871

PROCESS FOR PREVENTING YELLOWING OF POLYAMIDE FIBRE MATERIALS TREATED WITH STAIN-BLOCKING AGENTS BY TREATMENT WITH WATER-SOLUBLE LIGHT STABILIZER HAVING FIBRE AFFINITY

Gerhard Reinert, Allschwil, and Jörg Binz, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 25, 1989, Ser. No. 342,926

Claims priority, application Switzerland, May 4, 1988, 1666/88-0

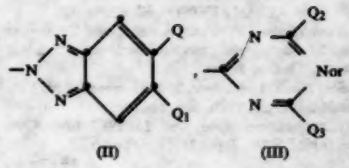
Int. Cl.[5] **D06M** *13/34, 15/41, 3/30;* **D06P** *5/06*

U.S. Cl. 8—115.59 **17 Claims**

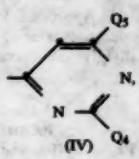
1. A process for preventing yellowing of a polyamide fiber material treated with a stain-blocking agent, which comprises treating the polyamide fiber material with a water-soluble light stabilizer with affinity for the fiber which is of the formula

(I)

in which R is a radical of the formula

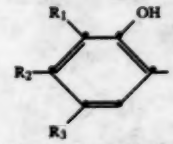


(II) (III)



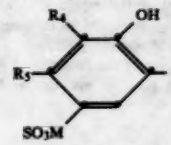
(IV)

in which Q is hydrogen or halogen, Q_1 is hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_2–C_9 alkoxycarbonyl, carboxyl or sulfo, Q_2 and Q_3 independently of one another are C_3–C_4 alkyl, C_1–C_4 alkoxy, C_5–C_6 cycloalkyl, phenyl or phenyl which is substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, C_2–C_5 alkanoyloxy, C_1–C_4 alkylcarbamoyloxy or hydroxy, Q_4 is phenyl or phenyl which is substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, sulfo, halogen or hydroxy and Q_5 is C_1–C_4 alkyl, phenyl or phenyl which is substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen or hydroxy, and the benzen ring A corresponds to the following radicals



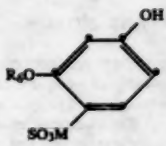
(V)

in which R_1 is hydrogen, C_1–C_4 alkyl, chlorine, C_5–C_6 cycloalkyl, C_7–C_9-phenylalkyl, sulfo or sulfo-C_7–C_9 phenylalkyl, R_2 is hydrogen, hydroxyl, C_1–C_4 alkyl, C_1–C_4 alkoxy, chlorine or sulfo and R_3 is C_1–C_4 alkyl, C_3–C_4-alkoxy, hydroxy, phenyl, (C_1–C_8 alkyl)-phenyl, C_5–C_6 cycloalkyl, C_2–C_9-alkoxycarbonyl, chlorine, carboxyethyl, C_7–C_9 phenylalkyl, sulfo or sulfo-C_7–C_9 phenylalkyl, if R is a radical of the formula (II);



(VI)

in which R_4 is hydrogen, halogen, C_1–C_4 alkyl or sulfo, R_5 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_2–C_5 alkanoyloxy, C_1–C_4 alkylcarbomoyloxy or hydroxy and M is hydrogen or an alkali metal, if R is radical of the formula (III), and



(VII)

in which R_6 is C_1–C_4 alkyl and M is hydrogen or an alkali metal, if R is a radical of the formula (IV), before, during or after the treatment with a stain-blocking agent.

4,964,872

PROCESS FOR RESIN FINISHING FABRICS

Takashi Ikeda, Yao; Hisao Takagishi, Soraku, and Terumasa Saka, Sakai, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 281,047, Dec. 8, 1988, abandoned. This application Jan. 25, 1990, Ser. No. 469,677

Claims priority, application Japan, Dec. 11, 1987, 62-314798

Int. Cl.[5] D06M 9/00, 1/00; D06P 3/82, 5/02

U.S. Cl. 8—115.66 13 Claims

1. A process for resin finishing cellulosic fabrics which comprises treating the fabrics with a combination of 1,3-dimethylglyoxalmonourein and trimethylolpropane.

4,964,873

FABRIC CONDITIONING METHOD

Bryan Duffin, and Zia Haq, both of Merseyside, England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 816,512, Jan. 6, 1986, abandoned. This application Mar. 20, 1989, Ser. No. 326,478

Claims priority, application United Kingdom, Jan. 15, 1985, 8500959

Int. Cl.[5] D06M 9/00, 1/02

U.S. Cl. 8—137 4 Claims

1. A method of laundering fabrics which includes the steps of:

(1) treating the fabrics with an aqueous liquor containing a fabric softening agent and positively charged water-insoluble thermoplastic particles which comprise a polymeric drape imparting agent selected from polymers and copolymers of monomeric materials having the general formula:

wherein each R_{10} is hydrogen or an alkyl group having 1 to 4 carbon atoms and R_{11} is selected from the group consisting of hydrogen, alkyl or alkoxy groups having 1 to 4 carbon atoms, halogen groups, aryl or alkyl aryl groups, carboxylic acid or carboxylic acid ester groups and acetoxy groups, and which have a softening point between 25° C. and 200° C.,

(2) separating the treated fabrics from said liquor;

(3) drying a first part of the fabric load at a temperature below the softening point of said material thereby to impart fabric softness thereto; and

(4) ironing a second part of the fabric load at a temperature above the softening point of said material thereby to impart body thereto.

4,964,874

HAIR TREATMENT PRODUCT

Fongchan Saphakkul, Bangkok, Thailand, assignor to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Filed Oct. 17, 1988, Ser. No. 258,738

Claims priority, application United Kingdom, Oct. 15, 1987, 8724254

Int. Cl.[5] A61K 7/13, 7/06

U.S. Cl. 8—429 12 Claims

1. An aqueous hair conditioner product comprising:

(i) from 0.1 to 5% by weight of a cationic surfactant,

(ii) from 0.1 to 5% by weight of a fatty alcohol having an alkyl group with from 8 to 22 carbon atoms,

(iii) from 0.001 to 0.5% by weight of a basic dye, and

(iv) from 0.001 to 5% by weight of a neutral dye;

the cationic surfactant being present in the form of a disperse lamellar liquid crystal phase, and the weight ratio of basic dye to neutral dye being from 1:20 to 1:2.

4,964,875

PROCESS FOR AFTER-TREATMENT OF DYED POLYAMIDE TEXTILE MATERIALS WITH POLYURETHANE CONTAINING QUATERNARY AMMONIUM GROUPS

Udo W. Hendricks, Odenthal; Josef Sanders, Cologne, and Ergun Tamer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 9, 1989, Ser. No. 349,742

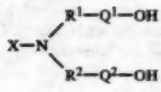
Claims priority, application Fed. Rep. of Germany, May 17, 1988, 3816699

Int. Cl.[5] D06P 1/52, 3/06, 5/08; C08G 18/83

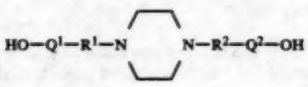
U.S. Cl. 8—442 12 Claims

1. A process for the after-treatment of anionically dyed polyamide textile materials comprising contacting said materials with polyurethanes containing quaternary ammonium groups, wherein the polyurethanes are obtainable by reaction of

(A) compounds containing tertiary amino groups and at least two hydroxyl groups comprising hydroxyalkylamines of the general formulae

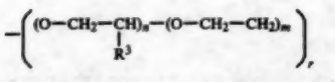


or

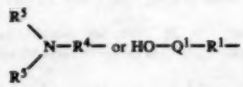


in which

Q^1 and Q^2, independently of one another, denote a radical of the general formula

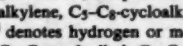


X denotes C_1–C_{18}-alkyl, C_5–C_8-cycloalkyl, C_7–C_9 aralkyl or a radical of the formula



R^1, R^2 and R^4, independently of one another, denote C_2–C_6-alkylene, C_5–C_8-cycloalkylene or C_7–C_9-aralkylene,

R^3 denotes hydrogen or methyl, R^5 denotes C_1–C_{18}-alkyl, C_5–C_8-cycloalkyl, C_7–C_9-aralkyl or a radical of the formula



and

m, n and r denote a number from 0 to 30

with

(B) polyisocyanates and

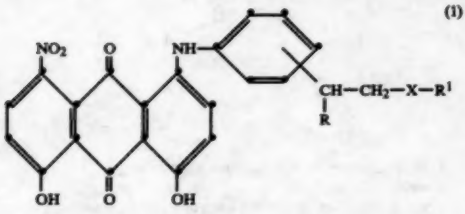
(C) quaternizing agents.

4,964,876
BLUE ANTHRAQUINONE DISPERSE DYES AND MIXTURES OF BLUE DISPERSE DYES

Christian Frey, Muttenz; Bernd Dill, Rheinfelden, and Konrad Schmid, Liestal, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

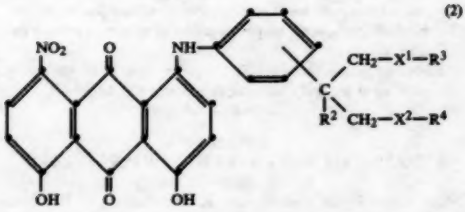
Filed May 18, 1989, Ser. No. 353,587
Claims priority, application Switzerland, May 24, 1988, 1963/88
Int. Cl.[5] C09B 1/51, 67/22; D06P 1/20
U.S. Cl. 8—643 14 Claims

1. A dye mixture containing at least one dye of each of the following formulae



(1)

and



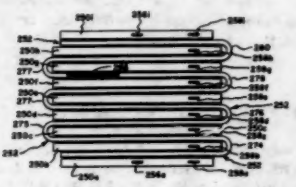
(2)

in which R and R^2, independently of one another, are each hydrogen or C_1–C_4alkyl, R^1, R^3 and R^4, independently of one another, are each hydrogen or C_1–C_8alkyl and X, X^1 and X^2, independently of one another, are each O or S.

4,964,877
NON-AQUEOUS LITHIUM BATTERY

Pamela P. Keister, Clarence; Ralph T. Mead, Kenmore; Barry C. Muffoletto, Alden; Esther S. Takeuchi, Snyder; Steven J. Ebel, Tonawanda; Michael A. Zelinsky, Lancaster, and John M. Greenwood, Williamsville, all of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.

Division of Ser. No. 818,879, Jan. 14, 1986, Pat. No. 4,830,940.
This application Mar. 14, 1989, Ser. No. 323,281
Int. Cl.[5] H01M 6/00
U.S. Cl. 29—623.1 9 Claims



1. A method of making an anode-cathode assembly for a solid cathode non-aqueous liquid electrolyte alkali metal cell for delivering high current pulses comprising the steps of:

(a) providing a cathode mix comprising cathode active material;

(b) providing a cathode conductor comprising a body portion and a lead portion;

(c) pressing said cathode mix on said conductor body portion to form a pellet;

(d) encapsulating said pellet with separator material;

(e) providing a plurality of cathode elements according to the foregoing steps;

(f) providing an elongated alkali metal anode comprising an elongated ribbon-like anode conductor, a pair of elongated ribbon-like alkali metal elements pressed together against opposite sides of said conductor to form an anode structure and separator material encapsulating said anode structure; and

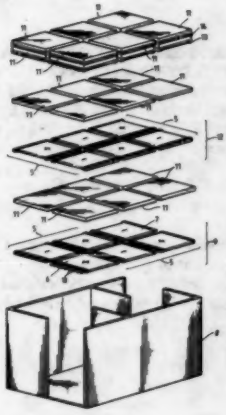
(g) folding said anode along the length thereof to form a serpentine structure; and

(h) placing said plurality of cathode elements between corresponding ones of the folds of said serpentine anode structure.

4,964,878
LEAD-ACID RECHARGEABLE STORAGE BATTERY

Chris Morris, Austin, Tex., assignor to Electrosource, Inc., Austin, Tex.

Filed Jun. 1, 1988, Ser. No. 200,977
Int. Cl.[5] H01M 6/48, 6/00
U.S. Cl. 29—623.1 24 Claims



1. A method for producing a gas recombining lead-acid electrochemical battery comprising:

assembling stacks of electrochemically unformed lead containing plates in such a manner that a positive plate in a particular position in one stack is connected to a negative plate in the same relative position in an adjacent stack by a common substrate of the said positive and negative plates;

positioning dry, highly porous, microfine glass fiber separators between said positive and negative plates;

applying compressive force on the stacks of plates, said compressive force being provided by fixing a battery cover on a battery container containing said stacks in order to exert controlled pressure on the stacks of plates and separators;

electrically connecting said negative plates and separately connecting all said positive plates in the terminal stacks to each other and to an external negative and an external positive terminal of the battery respectively;

flooding the unformed battery case with acid electrolyte so that the acid electrolyte is fully absorbed into the pores of the plates and separators;

draining excess acid electrolyte from the battery case after a predetermined soaking period has expired;

electrochemically forming the plates in place within the battery case in such a manner that pores in the plates and separators are less than fully filled; and

sealing the battery.

4,964,879

MIDDLE DISTILLATE FUEL CONTAINING DEPOSIT INHIBITOR

Sheldon Herbstman, New City, and Kashmir S. Virk, Hopewell Junction, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 27, 1989, Ser. No. 329,035

Int. Cl.[5] C10L *1/18, 1/22*

U.S. Cl. 44—434 **13 Claims**

1. A middle distillate fuel oil composition characterized by its ability to decrease deposit formation in passageways through which it passes which comprises

(i) a major portion of a hydrocarbon fuel oil boiling in the middle distillate fuel oil boiling range; and

(ii) a minor deposit-inhibiting portion of, as a deposit-inhibiting additive, an ether mono-primary amine of molecular weight $\overline{MM}_n$ of 200–400.

4,964,880

DISTILLATE FUELS CONTAINING MONO ALKYL SUBSTITUTED DERIVATIVES OF THIADIAZOLES

Alan M. Schilowitz, Highland Park; Harold Shaub, Berkeley Heights; Paul J. Berlowitz, East Windsor; Howard S. Homan, Piscataway, and Eric E. Wigg, Westfield, all of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Jun. 9, 1989, Ser. No. 364,741

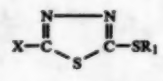
Int. Cl.[5] C10L *1/22, 1/24*

U.S. Cl. 44—341 **39 Claims**

1. A distillate fuel composition comprising

(a) a major amount of gasoline and

(b) a minor amount of a mono alkyl substituted derivative of a thiadiazole having the general structure



wherein R_1 is essentially a hydrocarbyl radical having a number average molecular weight between about 350 and about 5,000 and X is OH, NH_2, SH, or H.

4,964,881

CALCIUM IMPREGNATION OF COAL ENRICHED IN CO_2 USING HIGH-PRESSURE TECHNIQUES

Pramod K. Sharma, La Canada; Gerald E. Voecks, La Crescenta, and George R. Gavalas, Altadena, all of Calif., assignors to The California Institute of Technology, Pasadena, Calif.

Filed Feb. 13, 1989, Ser. No. 309,656

Int. Cl.[5] C10L *9/02*

U.S. Cl. 44—620 **29 Claims**

22. A method of impregnating coal with calcium comprising:

(a) pulverizing said coal to particles having sizes predominately in the range from 10 to 1000 microns;

(b) applying carbon dioxide gas under pressure to, and then removing said pressure from, said coal cyclically in a process including at least one cycle; and

(c) applying an aqueous slurry of calcium hydroxide and calcium acetate to said coal.

4,964,882

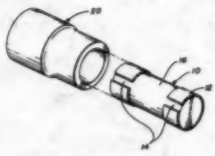
FLAME ARRESTOR

Alan R. Gaul, Mansfield, Mass., assignor to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 29,916, Mar. 25, 1987, abandoned. This application Jan. 25, 1988, Ser. No. 147,749

Int. Cl.[5] F17D *3/00*

U.S. Cl. 48—192 **7 Claims**



1. A flame arrestor construction comprising:

a multiplicity of flame arrestor pieces;

a removable shim placed between adjoining pieces, said shim being of a thickness so as to create a gap between the pieces that will allow air flow between the pieces when the shim is removed but such gap is within the tolerances needed to prevent the propagation of a flame through the gap; and

adjoining pieces being welded together at at least one point, said weld securely holding the pieces together.

4,964,883

CERAMIC ALUMINA ABRASIVE GRAINS SEEDED WITH IRON OXIDE

Mary Lou Morris, and Thomas E. Wood, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 12, 1988, Ser. No. 282,593

Int. Cl.[5] B24D *3/00*

U.S. Cl. 51—293 **17 Claims**

1. A process for forming ceramic abrasive grains, comprising the steps of:

(a) preparing a dispersion of alpha alumina monohydrate particles;

(b) seeding said dispersion with up to about .01 to 10% crystalline iron oxide particles

(c) gelling said dispersion;

(d) drying the seeded gelled dispersion to form a solid;

(e) calcining the solid;

(f) crushing the dried or calcined solid to form particles; and

(g) sintering the calcined particles, the improvement comprising said crystalline iron oxide particles having an average particle size of less than about 150 nm and said seeding being achieved by adding said crystalline iron oxide particles to said dispersion.

4,964,884

FLEXIBLE GRINDING TOOL AND PROCESS FOR PRODUCING IT

Günter Jürissen, Schenefeld, and Angelika Eichler, Pinneberg, both of Fed. Rep. of Germany, assignors to Inorddeutsche Industrie Christiansen & Co.(GmbH & Co.), Fed. Rep. of Germany

Filed Mar. 14, 1989, Ser. No. 323,315

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1988, 8803413

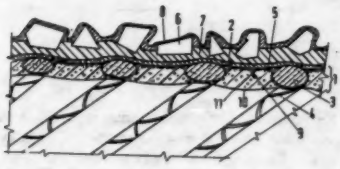
Int. Cl.[5] B24B *1/00*

U.S. Cl. 51—295 **22 Claims**

1. A flexible abrasive comprising:

a grain layer having a grain binder which carries abrasive grain;

a fibrous backing layer defining a front surface bearing on the grain layer and a rear surface facing away from the grain layer, the fibrous material of the backing layer having surface depressions on at least one of the front or rear surfaces; and



a finish forming part of the backing layer and at least partially filling the depressions on said at least one surface, the finish material being a foam solidified from a flowable state, whereby said surface is rendered smooth.

4,964,885

METHOD OF CLEANING EXHAUST GAS OF DRYING PLANTS AND AN APPARATUS FOR IMPLEMENTING SUCH METHOD

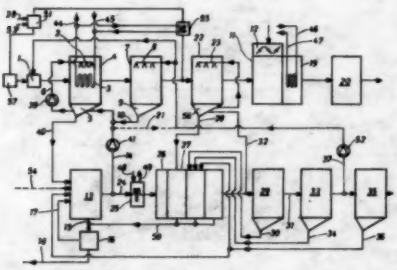
Johannes Wieser-Linhart, Salzburg, Austria, assignor to Hydrotechnik GmbH, Austria

Filed Aug. 15, 1989, Ser. No. 393,738

Claims priority, application Switzerland, Aug. 26, 1988, 3176/88

Int. Cl.[5] B01D *53/14, 53/32*

U.S. Cl. 55—8 **25 Claims**



1. A method of cleaning exhaust gas, comprising the steps

of lowering the dew point of the exhaust gas to a value in the range of 60°–85° C.;

of cooling the exhaust gas by a heat exchanging to a value in the range of 20°–60° C. in order to cause a condensing of water vapor and further condensable matter contained in the exhaust gas and

of simultaneously washing the exhaust gas being cooled by the condensate obtained by said condensing, which condensate is pre-purified and the pre-purified phase thereof recirculated for said washing of the exhaust gas;

of thereafter wet-filtering and further washing the gas by a recirculated liquid obtained from said condensate by a further purifying thereof;

of admixing the liquid obtained by said washing to the condensate obtained by said condensing such that a condensate/wash liquid mixture is produced;

of finally drying the gas by a reheating thereof up to a temperature in the range of 40°–60° C. thereby producing reheated dried gas; and

of subjecting said condensate/wash liquid mixture to a flotation and of dewatering and burning the sediment phase obtained thereby and of feeding the gas produced by said burning back to the initial exhaust gas to be cleaned.

4,964,886

PROCESS AND EQUIPMENT FOR SEPARATING A COMPONENT OF INTERMEDIATE PERMEABILITY FROM A GASEOUS MIXTURE

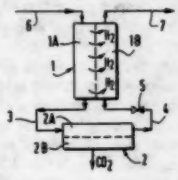
Jean-Renaud Brugerolle, and Laurent Ferenczi, both of Paris, France, assignors to L'Air Lquide, Societe Anouyme pour l'etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Sep. 8, 1989, Ser. No. 404,453

Claims priority, application France, Sep. 8, 1988, 88 11736

Int. Cl.[5] B01D *53/22*

U.S. Cl. 55—16 **9 Claims**



1. Process for separating a component of intermediate permeability from a gaseous mixture including also at least a more permeable component and a less permeable component, comprising introducing a said mixture into an upstream side of a first permeator having an upstream side and a downstream side, introducing residue from said upstream side into an upstream side of a second permeator having an upstream side and a downstream side, removing said component of intermediate permeability from the downstream side of said second permeator, introducing a residue from the upstream side of said second permeator substantially directly and totally into the downstream side of said first permeator, withdrawing from the downstream side of said second permeator a mixture of said more and less permeable components, and maintaining the partial pressure of said more permeable component in said mixture in said upstream side of said first permeator higher than the partial pressure of said more permeable component in said downstream side of said first permeator.

4,964,887

PROCESS FOR SEPARATING METHANE USING PERMEABLE MEMBRANE

Shunichi Shimatani; Michiharu Yamamoto; Akira Shimazu, and Akio Iwama, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

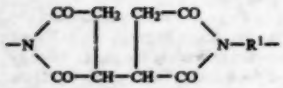
Filed Nov. 14, 1988, Ser. No. 270,583

Claims priority, application Japan, Nov. 12, 1987, 62-286789; Dec. 23, 1987, 62-327843; Dec. 23, 1987, 62-327844; Feb. 23, 1988, 63-041657; Apr. 20, 1988, 63-097739

Int. Cl.[5] B01D *59/10*

U.S. Cl. 55—16 **25 Claims**

1. A process for separating methane from a gaseous mixture containing methane and carbon dioxide by concentration, which comprises contacting said gaseous mixture with a membrane comprising a film of a polyimide resin having a repeating unit represented by formula (I):



wherein R^1 represents a divalent aromatic, alicyclic or aliphatic hydrocarbon group, or a divalent organic group composed of these hydrocarbon groups linked via a divalent organic linking group, to selectively pass carbon dioxide through said membrane.

4,964,888

MULTIPLE ZONE ADSORPTION PROCESS

Geoffrey Q. Miller, Chestnut Ridge, N.Y., assignor to UOP, Des Plaines, Ill.

Filed Dec. 27, 1989, Ser. No. 457,600

Int. Cl.[5] B01D *53/04*

U.S. Cl. 55—58 **34 Claims**

1. A process for separating a first component from a mixture of said first component and at least one other component by passing said mixture in vapor phase through a first adsorption zone comprising particulate adsorbent material having an average particle size that exceeds a minimum average particle size and subsequently through a second adsorption zone comprising particulate adsorbent material having an average particle size that does not exceed a maximum average particle size, wherein said maximum average particle size does not exceed said minimum particle size, at conditions effective to cause adsorption of at least a fraction of said mixture in the first adsorption zone and at least a fraction of said first component in the second adsorption zone and withdrawing a product depleted in said first component from a point downstream of the second adsorption zone.

4,964,889

SELECTIVE ADSORPTION ON MAGNESIUM-CONTAINING CLINOPTILOLITES

Chien-Chung Chao, Millwood, N.Y., assignor to UOP, Des Plaines, Ill.

Filed Dec. 4, 1989, Ser. No. 445,502

Int. Cl.[5] B01D *53/04*

U.S. Cl. 55—58 **31 Claims**

1. A process for separating a first gas containing molecules having molecular dimensions equal to or smaller than nitrogen from a feed containing mixtures thereof with at least one other gas containing molecules having molecular dimensions equal to or larger than methane, which comprises contacting the feed with a clinoptilolite molecular sieve that has a magnesium cation content that is sufficient to cause the first gas to be selectively absorbed on the clinoptilolite molecular sieve, said magnesium cation content being at least about 5 equivalent percent of the ion-exchangeable cations in the clinoptilolite molecular sieve, and recovering an effluent having a reduced amount of the first gas relative to the feed.

4,964,890

AROMATIC POLYETHER KETONES

Knud Reuter; Dieter Freitag, both of Krefeld; Günther Weymans, Leverkusen; Rolf Dhein, Krefeld; Erich Meier, Leverkusen, and Gerold Müller, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

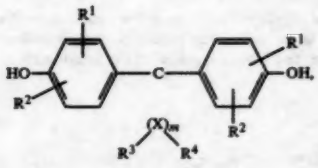
Filed Sep. 27, 1989, Ser. No. 413,347

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1988, 3833386; Oct. 24, 1988, 3836169

Int. Cl.[5] B01D *53/22, 71/38*

U.S. Cl. 55—158 **9 Claims**

6. 1 to 1500 μm thick films of polyether ketones based on diphenols corresponding to formula (I)



(I)

in which

R^1 and R^2 independently of one another represent hydrogen, halogen, preferably chlorine or bromine, C_{1-8} alkyl, C_{5-6} cycloalkyl, C_{6-10} aryl and C_{7-12} aralkyl,

m is an integer of form 4 to 7, preferably 4 or

R^3 and R^4 may be individually selected for each X and independently of one another represent hydrogen or C_{1-6} alkyl and alkyl and

X represents carbon,

with the proviso that, at at least one atom X, both R^3 and R^4 are alkyl.

9. A gas permeation membrane comprising the film of claim 6.

4,964,891

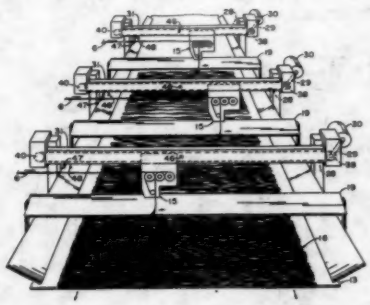
PROGRAMMABLY CONTROLLED FIBER GLASS STRAND FEEDERS AND IMPROVED METHODS FOR MAKING GLASS FIBER MATS

William L. Schaefer, Butler, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 13, 1988, Ser. No. 435,903

Int. Cl.[5] C03B *37/07*

U.S. Cl. 65—4.4 **21 Claims**



1. In a method for making a mat of continuous fiber strands by reciprocating at least one strand feeder back and forth across the surface of a moving conveyor, said strand feeder being caused to traverse the width of said conveyor by a first electric motor, said feeder also drawing at least one strand from a supply source and depositing it onto the surface of said conveyor by means of a second electric motor carried on said feeder, said supply source being a fiber glass bushing assembly issuing a plurality of individual streams of molten glass which are cooled and attenuated into individual glass fibers and subsequently gathered into at least one continuous strand of glass fibers, the improvement comprising: independently changing both the velocity profile with which said feeder is traversed across the width of said conveyor and the rate at which strand is attenuated, drawn, and advanced onto the surface of said conveyor as a function of the changing position of said strand feeder with respect to the width of said conveyor so as to attenuate individual fibers of substantially constant diameter and distribute the strand formed therefrom upon the surface of

said conveyor, thereby forming a loose mate of glass fiber strand having substantially uniform thickness and density.

4,964,892

SYNERGISTIC MICROBICIDAL COMBINATIONS CONTAINING 2-N-OCTYL-3-ISOTHIAZOLONE AND CERTAIN COMMERCIAL BIOCIDES

Jemin C. Hsu, Fort Washington, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Mar. 10, 1989, Ser. No. 322,455
Int. Cl.[5] A01N *43/80*
U.S. Cl. 71—67 **6 Claims**

1. A microbicidal mixture the first component of which is 2-n-octyl-4-isothiazolin-3-one and the second component dodecylamine wherein the ratio of the first component to the second component is in the range of from 10:1 to about 1.2:1,

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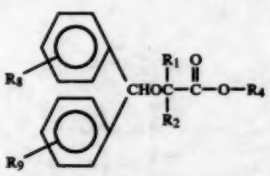
4,964,893

BENZHYDRYL COMPOUNDS AS HERBICIDE ANTIDOTES

Lawrence H. Brannigan, Olivette; Ronald J. Brinker; Robert J. Kaufman, both of St. Louis, and Suzanne Metz, Chesterfield, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 17, 1986, Ser. No. 853,301
Int. Cl.[5] A01N *31/04, 37/22, 37/34, 43/50*
U.S. Cl. 71—88 **36 Claims**

1. A method for reducing injury to a crop plant due to an acetamide or thiocarbamate herbicide which comprises applying to the plant locus an antidotally-effective amount of at least one compound of the formula



wherein

R_1 and R_2 are H or alkyl;

R_4 is alkyl, alkenyl, alkynyl, haloalkyl, cycloalkyl, alkoxyalkyl, alkoxycarbonylalkyl, alkylthioalkyl, hydroxyalkyl, phenyl or benzyl and, when not self-inclusive, said R_4 members substituted with alkyl, cycloalkyl, alkoxy, haloalkyl, phenyl, halophenyl, alkoxyphenyl or nitro groups and

R_8 and R_9 are independently H, alkyl, alkoxy, halo or haloalkyl.

4,964,894

PLANT GROWTH REGULATORS DERIVED FROM CHITIN

Donald E. Freepons, 535 N. Montana, Kennewick, Wash. 99336

Continuation-in-part of Ser. No. 25,586, Mar. 13, 1987, Pat. No. 4,812,159, which is a continuation-in-part of Ser. No. 846,064, Mar. 31, 1986, abandoned. This application Mar. 13, 1989, Ser. No. 322,450
The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.
Int. Cl.[5] A01N *43/00*
U.S. Cl. 71—88 **48 Claims**

1. A process for regulating plant growth comprising the steps of:

dissolving chitosan in a non-phytotoxic acid to produce an aqueous solution comprising about 0.1% by volume to about 10% by volume chitosan and about 0.1% by volume to about 10% by volume of said non-phytotoxic acid, and distributing said aqueous solution in soil in which plants will be grown, in the seed planting zone.

4,964,895

SUBSTITUTED 4-(4-NITROPHENOXY) PYRAZOLES AND THEIR USE AS HERBICIDES

Kurt Moedritzer, Webster Groves, and Michael D. Rogers, Maryland Heights, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 175,460, Apr. 13, 1988, abandoned, which is a continuation-in-part of Ser. No. 59,712, Jun. 8, 1981, abandoned. This application Jan. 30, 1990, Ser. No. 471,686
Int. Cl.[5] C07D *231/14, 231/16, 231/20*; A01N *43/56*
U.S. Cl. 71—92 **38 Claims**

1. A 3-phenoxypyrazole or agronomically acceptable salt thereof wherein:

the phenyl ring has a para nitro substituent; and the pyrazole ring has a methyl, ethyl, halomethyl or haloethyl substituent in the 1-position; a hydrido, halo or nitro substituent in the 4-position; and a chloro, cyano, halomethyl, haloethyl, methylthio, ethylthio, methylsulfinyl, ethylsulfinyl, methylsulfonyl, ethylsulfonyl or methoxymethyl substituent in the 5-position; and optionally a meta substituent.

27. A method of controlling the growth of undesirable vegetation comprising apply to the plant locus an effective amount of a 3-phenoxypyrazole or agronomically acceptable salt thereof wherein:

the phenyl ring has a para nitro substituent; and the pyrazole ring has a methyl, ethyl, halomethyl or haloethyl substituent in the 1-position; a hydrido, halo or nitro substituent in the 4-position; and a chloro, cyano, halomethyl, haloethyl, methylthio, ethylthio, methylsulfinyl, ethylsulfinyl, methylsulfonyl, ethylsulfonyl or methoxymethyl substituent in the 5-position; and optionally a meta substituted.

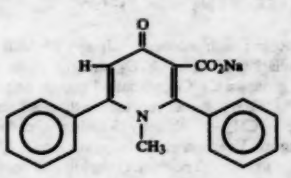
4,964,896

CERTAIN-2,6-DIPHENYL-1,4-DIHYDRO-4-OXO-NICOTINATES WHICH ARE USEFUL FOR INDUCING MALE STERILITY IN CEREAL GRAIN PLANTS

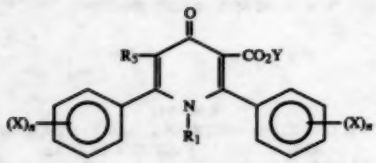
Glenn R. Carlson, North Wales, Pa., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 38,486, Apr. 13, 1987, abandoned, which is a continuation of Ser. No. 491,838, May 5, 1983, abandoned, which is a division of Ser. No. 260,577, May 5, 1981, abandoned, which is a continuation-in-part of Ser. No. 250,711, Apr. 16, 1981, abandoned, which is a continuation-in-part of Ser. No. 148,079, May 12, 1980, abandoned. This application Aug. 15, 1988, Ser. No. 232,517
Int. Cl.[5] C07D *213/55, 213/68*; A01N *43/40*
U.S. Cl. 71—94 **6 Claims**

1. A compound having the formula:



4. A method for inducing male sterility in a cereal grain plant which comprises treating the plant prior to meiosis with an amount effective to produce male sterility in the plant of a compound of the following formula:



wherein

R_1 is an optionally substituted (C_1–C_6) alkyl group;

R_5 is a hydrogen atom, a (C_1–C_4) alkyl group or a halogen atom;

Y is a hydrogen or a (C_1–C_6) alkyl group;

X is a hydrogen, a halogen atom, a trihalomethyl, a (C_1–C_6) alkyl, a nitro, a cyano, or a (C_1–C_4) alkoxy group and

n is the integer 1 or 2 and the agronomically acceptable alkali metal or acid addition salts thereof.

4,964,897

ALDITOL ESTER DERIVATIVES OF TRICLOPYR, THEIR PREPARATION AND HERBICIDAL USE THEREOF

Nicholas Dennis, Norfolk, and Donald C. Burrell, Newbury, both of England, assignors to The Dow Chemical Company, Midland, Mich.

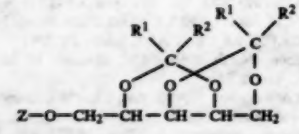
Division of Ser. No. 36,947, Apr. 10, 1987, Pat. No. 4,857,102. This application May 1, 1989, Ser. No. 345,511

Claims priority, application United Kingdom, May 28, 1986, 12940/86

Int. Cl.[5] C07D *405/14*; A01N *43/40*

U.S. Cl. 71—94 **18 Claims**

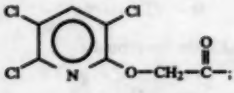
1. A compound corresponding to the general formula



(IV)

wherein

Z represents

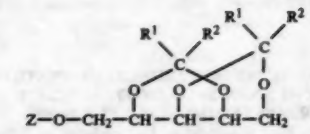


(A)

R^1 and R^2 are each independently any sterically compatible combination of H, a C_1–D_6 straight chain or branched alkyl group, a C_3–C_6 cycloalkyl group, or phenyl; or

R^1 and R^2 taken together represent a divalent polymethylene group —CH_2—n, thereby forming a carbocyclic ring having n+1 carbon atoms wherein n is 3, 4, 5 or 6.

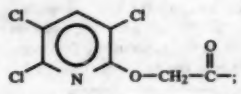
11. A method for the postemergent kill and control of weeds which comprises applying to said weeds a herbicidally effective amount of a composition containing as the active component an alditol derivative ester of triclopyr in intimate admixture with an inert carrier therefor and said active component is a compound corresponding to one of the general formula



(IV)

wherein

Z represents



(A)

R^1 and R^2 are each independently any sterically compatible combination of H, a C_1–C_6 straight chain or branched alkyl group, a C_3–C_6 cycloalkyl group, or phenyl; or

R^1 and R^2 taken together represent a divalent polymethylene group —CH_2—n, thereby forming a carbocyclic ring having n+1 carbon atoms wherein n is 3, 4, 5 or 6.

4,964,898

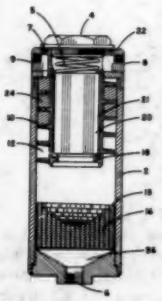
DRYER SEPARATER

Junji Toda, Fujieda, Japan, assignor to Vividstar International Inc., Valinda, Calif.

Filed Apr. 3, 1989, Ser. No. 331,873

Int. Cl.[5] B01D *50/00*

U.S. Cl. 55—337 **3 Claims**



1. An improved air filtering device for separating liquid and solid impurities from a stream of forced air, which comprises.

a housing,

a cylindrical central bore in said housing,

an impurities air filtering element inserted into and seated in said cylindrical central bore,

a spiral plate surrounding and encircling said cylindrical central bore thereby defining a downwardly directed helical passageway,

a mesh coalescer filled inside said helical passageway,

a liquid protective unit seated in a lower part of said housing below said cylindrical central bore,

a contaminant cavity in the lower part of said housing below said liquid protective unit,

a drainage opening for draining liquid contaminants from said contaminant cavity,

Said helical passageway connecting at its upper end with an inlet port of said housing, and at its lower end with said liquid protective unit, and directing a stream of forced air downwardly from said inlet port through said mesh coalescer and coalescently, centrifugally and gravitationally separating liquid contaminants from said forced air, and

collecting said liquid contaminant through said liquid protective unit into said contaminant cavity, an outlet port in an upper part of said housing above said air filtering element allowing said forced air to escape upwardly from said housing.

4,964,899

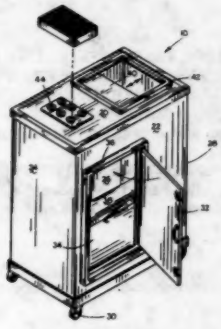
APPARATUS FOR TRANSPORTING A PERSON FROM A CONTAMINATED AREA TO A DECONTAMINATION FACILITY

Steven C. Griffis, 2929 Avenue D, Council Bluffs, Iowa 51501

Filed May 2, 1988, Ser. No. 188,843

Int. Cl.[5] B01D *46/10*

U.S. Cl. 55—356 **3 Claims**



1. An apparatus for transporting a person from an asbestos-contaminated area to a decontamination facility comprising,

an upstanding enclosure means comprising a bottom, a top, wall means extending between said top and said bottom, and an interior adapted to accommodate at least one person,

said wall means having at least one selectively closable and sealable door means provided therein to permit a person to enter said interior of said enclosure means and to exit therefrom, and to maintain asbestos contaminants within said enclosure while closed,

a protruding abutment means extending outwardly from said side wall means around said door means, to provide sealable connection with a contaminated area or a decontamination facility,

an air inlet and filtering means mounted in said enclosure means to allow the entrance and exit of air to the interior thereof, and adapted to prevent the passage of contaminated asbestos materials from the interior of said enclosure means,

and a wheel means on said bottom to permit said enclosure means to be moved from the contaminated area to the decontamination facility.

4,964,900

RESPIRATOR FILTER MEANS FOR REMOVAL OF TRITIATED WATER

Ronald E. Thompson, North Huntingdon, and William P. King, Washington, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jan. 25, 1989, Ser. No. 301,664

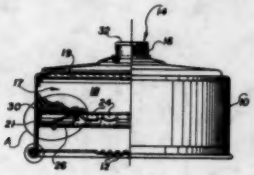
Int. Cl.[5] G21F *9/12, 9/02*; B01D *59/00, 39/00*

U.S. Cl. 55—387 **3 Claims**

1. Filter means for removal of tritiated water comprising:

A. a housing having a fluid inlet and outlet and a filter chamber interposed between and in communication with said inlet and outlet, said chamber being adapted to contain a tritium filter media; and

B. a tritium filter media selected from the group consisting of particulate activated carbon and particulate silica gel, said media having a moisture content of from about 25% to



40% by weight of said media and a particulate distribution size range of from 6×20 to 12×30.

4,964,901

LOW-TEMPERATURE SEPARATION OF AIR USING HIGH AND LOW PRESSURE AIR FEEDSTREAMS

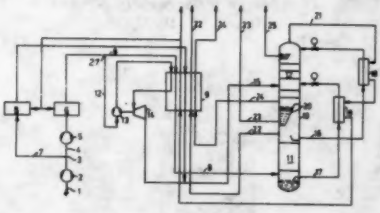
Wilhelm Rhode, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed May 19, 1989, Ser. No. 354,257

Claims priority, application Fed. Rep. of Germany, May 20, 1988, 3817244

Int. Cl.[5] F25J *5/00*

U.S. Cl. 62—13 **33 Claims**



1. A process for the low temperature separation of air comprising passing a compressed, prepurified, and cooled first air feedstream at least partially into a high pressure stage of a two-stage rectification column and passing a second compressed, prepurified, and cooled air feedstream into a low pressure stage of the rectification column, said first air feedstream having been compressed to a higher pressure than the pressure of said second air feedstream entering said low pressure stage.

4,964,902

METHOD OF EXTRACTING SPIN CAST FUSED SILICA

Paul Guibert, Bellegarde, and Francis A. P. Launay, Pithiviers-le-Vieil, both of France, assignors to Quartz & Silice, Courbevoie, France

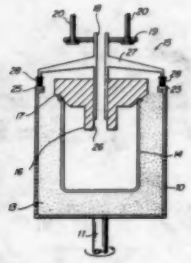
Filed Feb. 10, 1989, Ser. No. 309,585

Int. Cl.[5] C03B *19/00*

U.S. Cl. 65—71 **16 Claims**

6. In a method for making a fused silica glass object in a rotating pot by filling the pot with a pulverulent refractory material, rotating the pot to form a cavity in said pulverulent material, introducing a fusible, silica-rich glass forming material into the cavity, melting said silica-rich glass forming material to form a fused silica object in the shape of said cavity and with an open interior portion, and cooling the silica glass object produced, the improvement which comprises removing the fused silica glass object from said cavity by extracting the object vertically while the pot and object are rotating while sealingly contacting the upper edges of said object with a rotating gripping member; reducing the pressure between said

object and said gripping member to secure said object to said gripping member, and raising the rotating gripping member



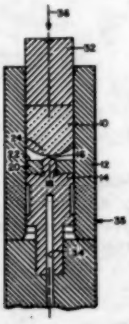
with the object adhered to it at a rate which causes minimum disturbance to the pulverulent refractory material.

4,964,903

APPARATUS FOR MOLDING GLASS MOLDS

Larry L. Carpenter, Painted Post; Mark L. Morrell, Horseheads, and Peter A. Schrauth, Elmira, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Mar. 8, 1989, Ser. No. 320,693
Int. Cl.[5] C03B 11/00
U.S. Cl. 65—275 11 Claims



1. An apparatus for molding a glass mold comprising;
a constraining means having an axial portion for receiving a preform,
a two-piece master comprising a master body with a snout portion extending axially of said constraining means and a master ring having a predetermined axial thickness and interior diameter disposed about said snout portion,
the snout portion of said master body having a molding surface thereon disposed within said constraining means,
said master ring having a molding surface thereon disposed within and extending adjacent to said constraining means,
said master ring being positioned about said snout portion with said snout portion projecting completely through said master ring such that only said molding surfaces of said snout and said master ring are exposed within said constraining means and said master ring molding surface forms a peripheral portion radially outwardly about said snout portion molding surface, and
means for applying an axial force disposed within said constraining means in opposing cooperative relationship between a preform and said molding surfaces of said snout and said master ring, with the molding surface of said master ring forming a mold surface on said preform and the exposed molding portion of said snout defining a portion to impress a cavity within said preform.

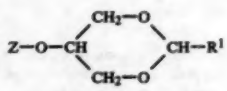
4,964,904

ALDITOL ESTER DERIVATIVE OF TRICHLOROPYRIDINE AND HERBICIDAL USE THEREOF

Nicholas Dennis, Norfolk, and Donald C. Burrell, Newbury, both of England, assignors to The Dow Chemical Company, Midland, Mich.

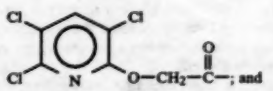
Division of Ser. No. 36,947, Apr. 10, 1987, Pat. No. 4,857,102.
This application May 1, 1989, Ser. No. 345,518
Claims priority, application United Kingdom, May 28, 1986, 8612940
Int. Cl.[5] C07D 405/12; A01N 43/40
U.S. Cl. 71—94 6 Claims

1. A compound corresponding to the general formula



(II)

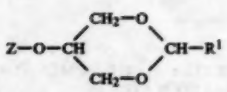
wherein
Z represents



(A)

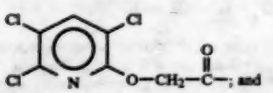
R^1 represents H, a C_1–C_6 straight chain or branched alkyl group, a C_3–C_6 cycloalkyl group, or phenyl.

3. A method for the postemergent kill and control of weeds which comprises applying to said weeds a herbicidally effective amount of a composition containing as the active component an alditol derivative ester of triclopyr in intimate admixture with an inert carrier therefor and said active component is a compound corresponding to the general formula



(II)

wherein
Z represents



(A)

R^1 represents H, a C_1–C_6 straight chain or branched alkyl group, a C_3–C_6 cycloalkyl group, or phenyl.

4,964,905

N-SUBSTITUTED-PHENYLTERACONIMIDE COMPOUND, HERBICIDAL COMPOSITION, AND METHOD FOR THE DESTRUCTION OF UNDESIRABLE WEEDS

Hiroyuki Kouji, and Teruyuki Misumi, both of Yokohama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

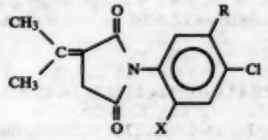
Filed Feb. 6, 1986, Ser. No. 826,608

Claims priority, application Japan, Feb. 7, 1985, 60-20984; Mar. 15, 1985, 60-50584; Mar. 19, 1985, 60-53280; Nov. 29, 1985, 60-267244

Int. Cl.[5] **C07D** *207/325, 413/10;* **A01N** *37/24*

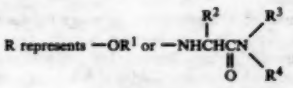
U.S. Cl. 71—95 **25 Claims**

1. An N-substituted-phenylteraconimide compound represented by the formula



(I)

wherein X represents a hydrogen atom, a fluorine atom or a chlorine atom; and



wherein

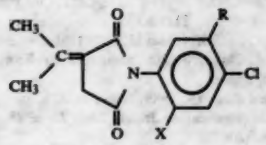
R^1 represents a hydrogen atom, a straight chain or branched alkyl group having up to 8 carbon atoms, a straight chain or branched alkenyl group having up to 8 carbon atoms, an alkynyl group having up to 8 carbon atoms, a cycloalkyl group having up to 8 carbon atoms wherein a carbon atom thereof is unsubstituted or substituted with an oxygen atom, a sulfur atom or a carbonyl group, or a straight chain or branched alkyl or alkenyl group having up to 8 carbon atoms and substituted with at least one substituent selected from the group consisting of a halogen atom, a cyano group, a hydroxyl group, an alkoxyl group having up to 8 carbon atoms, an alkylthio group having up to 8 carbon atoms, an epoxy group, a substituted or unsubstituted aromatic hydrocarbon group having up to 8 carbon atoms, an acyl group having up to 8 carbon atoms and an alkoxycarbonyl group having up to 8 carbon atoms,

R^2 represents a hydrogen atom or a straight chain or branched alkyl group having up to 8 carbon atoms, and

R^3 and R^4 each independently represent a hydrogen atom, a straight chain or branched alkyl group having up to 8 carbon atoms, a straight chain or branched alkenyl group having up to 8 carbon atoms, an alkynyl group having up to 8 carbon atoms, an alkoxyl group having up to 8 carbon atoms, an alkoxyalkyl group having up to 8 carbon atoms, an alkoxycarbonylalkyl group having up to 8 carbon atoms, a cycloalkyl group having up to 8 carbon atoms, a hydroxyalkyl group having up to 8 carbon atoms, a cyanoalkyl group having up to 8 carbon atoms, an aralkyl group having up to 9 carbon atoms or an aryl group having up to 8 carbon atoms, or

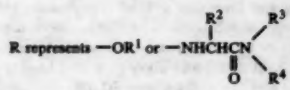
R^3 and R^4 are directly bonded with each other, thereby forming with the nitrogen atom bonded therewith a morpholine ring group.

15. A method for the destruction of undesirable weeds, which comprises applying to said weeds, in an amount of from 0.4 to 100 g/10a in terms of the amount of an active ingredient, a herbicidal composition which comprises as an active ingredient a herbicidally effective amount of an N-substituted phenylteraconimide compound represented by the formula



(I)

wherein X represents a hydrogen atom, a fluorine atom or a chlorine atom; and



wherein

R^1 represents a hydrogen atom, a straight chain or branched alkyl group having up to 8 carbon atoms, a straight chain or branched alkenyl group having up to 8 carbon atoms, an alkynyl group having up to 8 carbon atoms, a cycloalkyl group having up to 8 carbon atoms wherein a carbon atom thereof is unsubstituted or substituted with an oxygen atom, a sulfur atom or a carbonyl group, or a straight chain or branched alkyl or alkenyl group having up to 8 carbon atoms and substituted with at least one substituent selected from the group consisting of a halogen atom, a cyano group, a hydroxyl group, an alkoxyl group having up to 8 carbon atoms, an alkylthio group having up to 8 carbon atoms, an epoxy group, a substituted or unsubstituted aromatic hydrocarbon group having up to 8 carbon atoms, an acyl group having up to 8 carbon atoms and an alkoxycarbonyl group having up to 8 carbon atoms,

R^2 represents a hydrogen atom or a straight chain or branched alkyl group having up to 8 carbon atoms, and

R^3 and R^4 each independently represent a hydrogen atom, a straight chain or branched alkyl group having up to 8 carbon atoms, a straight chain or branched alkenyl group having up to 8 carbon atoms, an alkynyl group having up to 8 carbon atoms, an alkoxyl group having up to 8 carbon atoms, an alkoxyalkyl group having up to 8 carbon atoms, an alkoxycarbonylalkyl group having up to 8 carbon atoms, a cycloalkyl group having up to 8 carbon atoms, a hydroxyalkyl group having up to 8 carbon atoms, a cyanoalkyl group having up to 8 carbon atoms, an aralkyl group having up to 9 carbon atoms or an aryl group having up to 8 carbon atoms, or

R^3 and R^4 are directly bonded with each other, thereby forming with the nitrogen atom bonded therewith a morpholine ring group.

4,964,906

METHOD FOR CONTROLLING THE OXYGEN CONTENT OF TANTALUM MATERIAL

James A. Fife, Box 151, R.D. 2, Douglassville, Pa. 19518

Filed Sep. 26, 1989, Ser. No. 412,426

Int. Cl.[5] **C22C** *3/00;* **C21D** *1/00*

U.S. Cl. 75—369 **8 Claims**

1. A process for controlling the oxygen content in tantalum material comprising heating said material at a temperature ranging from about 900° C. to about 2400° C. under a hydrogen-containing atmosphere in the presence of a tantalum getter metal having an oxygen concentration prior to said heating lower than that of said tantalum material.

4,964,907

SINTERED BODIES AND PRODUCTION PROCESS THEREOF

Yoshiasto Kiyota; Junichi Ohta; Hiroshi Ohtsubo, and Shigeaki Takajo, all of Chiba, Japan, assignors to Kawasaki Steel Corp., Hyogo, Japan

Filed Aug. 14, 1989, Ser. No. 393,765
Claims priority, application Japan, Aug. 20, 1988, 63-206703; Aug. 20, 1988, 63-206705
Int. Cl.[5] C22C 29/12
U.S. Cl. 75—235 5 Claims

1. A process for the production of a sintered body, which comprises the following steps:

(i) mixing and kneading at least one powder selected from the group which consists of one or more metal powders and one or more alloy powders with a binder into a compound, said metal and alloy powders having an average particle size not greater than 30 μm;

(ii) injection-molding the compound into a green body;

(iii) debinding the green body to form a debound body; and

(iv) subjecting the debound body to first-stage sintering at 1,050°–1,250° C. in a reducing or reduced-pressure atmosphere and then subjecting the body to second-stage sintering at a temperature in the range of 1,100°–1,400° C., which temperature is higher than that of the first-stage sintering.

4,964,908

HIGH DENSITY SINTERED FERROUS ALLOYS

Geoffrey Greetham, Ipswich, England, assignor to Manganese Bronze Limited, Ipswich, England

PCT No. PCT/GB87/00830, § 371 Date Jul. 21, 1989, § 102(e) Date Jul. 21, 1989, PCT Pub. No. WO88/03961, PCT Pub. Date Jun. 2, 1988
PCT Filed Nov. 20, 1987, Ser. No. 391,521
Claims priority, application United Kingdom, Nov. 21, 1986, 8627846
Int. Cl.[5] C22C 29/02
U.S. Cl. 75—241 19 Claims

1. A sintered high speed steel of at least 95% theoretical density consisting essentially of, in percentages by weight:

carbon	0.6–2.5%
chromium	2–8%
copper	4.5–20%
molybdenum	0.5–10%
phosphorus	0.4–1.2%
tungsten	1–20%
vanadium	1–5%
cobalt	0–12%
manganese	0–2%
nickel	0–2%

the balance being iron and less than 2% by weight impurities, wherein the molybdenum, tungsten and vanadium contents are such that the % carbon content is in the range CCC%−0.1% to CCC%+0.3%, where CCC% is the calculated carbon content= (CWE/20)−0.4 and CWE=% tungsten content+twice % molybdenum content+six times % vanadium content, and wherein the phosphorus is derived from a copper phosphide containing 2 to 14% phosphorus.

4,964,909

HEAT-INSULATING COMPONENT AND A METHOD OF MAKING SAME

Ulf Engström, and Olavi Mustonen, both of Höganäs, Sweden, assignors to Hoganas AB, Hoganas, Sweden

PCT No. PCT/SE87/00292, § 371 Date Jan. 4, 1989, § 102(e) Date Jan. 4, 1989, PCT Pub. No. WO88/00102, PCT Pub. Date Jan. 14, 1988
PCT Filed Jun. 24, 1987, Ser. No. 304,513
Claims priority, application Sweden, Jul. 4, 1986, 8602994
Int. Cl.[5] B22F 9/00
U.S. Cl. 75—246 11 Claims

1. A heat-insulating component consisting of a porous body obtained by molding and sintering an iron-base powder consisting of an admixture of 2–10% by weight of silicon, an admixture of 5–10% by weight of manganese, an admixture of 10–25% by weight of chromium, an admixture of 0–15% by weight of nickel, an admixture of 0–2.5% by weight of molybdenum and an admixture of 0–2% by weight of carbon.

4,964,910

TRANSFER FLUID FOR SPIRIT DUPLICATING SYSTEMS

Donald R. Beck, Pompton Plains; Loren Shelffo, South Orange, and Susan P. Ontawar, North Haledon, all of N.J., assignors to Repeat-O-Type Manufacturing Corporation, Wayne, N.J.

Filed May 30, 1989, Ser. No. 358,834
Int. Cl.[5] C09D 11/00
U.S. Cl. 106—21 7 Claims

1. In a method of transferring an image from a master copy sheet to a duplicate copy sheet in a spirit type duplicating system wherein the copy sheet used to contact the master sheet is dampened with a transfer fluid which is capable of extracting from said master sheet onto said copy sheet an image forming dye that is contained on said master sheet and to thereby impart a duplicate image on the copy sheet, the improvement of inhibiting curling of the copy sheet comprising employing a transfer fluid that inhibits paper curling, is

4,964,911

ADHESIVE BONDING OF ACRYLIC RESINS, ESPECIALLY IN DENTISTRY

Robert L. Ibsen, Santa Maria, and William R. Glace, Orcutt, Donald R. Pacropis, Santa Maria, all of Calif., assignors to Den-Mat Corporation, Santa Maria, Calif.

Continuation-in-part of Ser. No. 107102, Oct. 13, 1987, abandoned. This application Dec. 16, 1988, Ser. No. 285,502
Int. Cl.[5] A61C 13/23; A61K 6/08
U.S. Cl. 106—35 44 Claims

1. A method for preparing the surface of dentin, enamel, or other natural or industrial substrates containing or capable of binding metallic ions, for adhesion of composite materials or resins, which method comprises:

(a) first contacting with the surface an aqueous solution comprising at least one strong acid or acidic salt,

(b) then contacting with the surface a solution comprising a solvent and at least one compound selected from the group consisting of (1) N-phenylglycine in a mixture with the alkali metal salt of N-phenylglycine, (2) a mixture of the adduct of the alkali salts of N(p-tolyl)glycine and glycidyl methacrylate, with the adduct of N(p-tolyl)glycine and glycidyl methacrylate (3) the addition reaction product of the alkali metal salt of the addition reaction product of the alkali metal salt of N-phenylglycine and glycidyl methacrylate, and the addition reaction product of N-phenylglycine and glycidyl methacrylate, and (4) other amino acids each of which is combined in a mixture with an alkali metal salt thereof, wherein the alkali metal salt for each of said mixtures comprises between 40% and 60% of the total mixture, and

(c) then contacting with the surface a solution comprising at least one monomer selected from the group consisting of

(1) the addition reaction product of pyromellitic acid dianhydride and 2-hydroxyethyl methacrylate, (2) the addition reaction product of 3,3',4,4'-benzophenone tetracarboxylic dianhydride and 2-hydroxyethyl methacrylate, (3) 4-methacryloxyethyltrimelliticanhydride, and (4) other compounds containing at least one group or moiety capable of free radical polymerization and at least one aromatic ring or moiety containing electron-withdrawing substituents that do not interfere with free radical polymerization.

4,964,912

HEAT-CURING CEMENT COMPOSITION, METHOD OF HARDENING SAME, AND HARDENED BODY FORMED THEREFROM

Shigeo Okabayashi; Mototaka Egawa, and Masao Yuge, all of Ube, Japan, assignors to UBE Industries, Ltd., Japan

Filed Jun. 21, 1989, Ser. No. 369,620

Claims priority, application Japan, Jun. 28, 1988, 63-158102

Int. Cl.[5] C04B *7/06*

U.S. Cl. 106—705 **5 Claims**

1. A heat curing cement composition comprising 60 to 75% by weight of $3CaO.SiO_2$, in which the total content of $3CaO.Al_2O_3$ and $4CaO.Al_2O_3.Fe_2O_3$ is lower than 10% by weight, the alkali content is lower than 0.2% by weight as the Na_2O equivalent, the balance is composed mainly of $2CaO.SiO_2$ and gypsum, and the Blain specific surface area is 3500 to 5500 cm^2/g.

4,964,913

HIGH BENDING STRENGTH, LARGE IMPACT STRENGTH HYDRAULIC SUBSTANCES REINFORCED WITH ACRYLONITRILE FIBERS AND A PROCESS FOR PRODUCTION THEREOF

Takashi Takada, and Kenichi Hirao, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 39,837, Apr. 17, 1987, abandoned, which is a continuation of Ser. No. 728,917, Apr. 30, 1985, abandoned, which is a division of Ser. No. 688,393, Jan. 2, 1985, abandoned. This application Apr. 14, 1989, Ser. No. 338,838

Claims priority, application Japan, Jun. 19, 1984, 59-125818

Int. Cl.[5] C04B *7/02*

U.S. Cl. 106—808 **5 Claims**

1. A fiber-reinforced hydraulic substance comprising a hydraulic substance and, as a reinforcing fiber, a dry-jet wet spun high tenacity acrylonitrile (AN) fiber of an acrylonitrile polymer mainly composed of acrylonitrile having an intrinsic viscosity of at least 2.5, said acrylonitrile (AN) fiber having an X-ray crystalline orientation of at least 93%, a tensile strength of at least 10 g/d, an initial modulus of at least 180 g/d, a knot strength of at least 2.2 g/d and a contrast glossiness of at least 10%.

4,964,914

METHOD FOR DISPOSING OF HAZARDOUS WASTE MATERIAL WHILE PRODUCING A REUSABLE BY-PRODUCT

E. L. "Buddy" Leath, Avalon, Tex., assignor to Chemical Reclamation Services, Inc., Avalon, Tex.

Filed Aug. 10, 1988, Ser. No. 230,855

Int. Cl.[5] C04B *7/02*

U.S. Cl. 106—745 **5 Claims**

5. A method for disposing of hazardous waste material containing flammable organic chemical components at least part of which are solid to an essentially liquid flammable fuel product having a BTU content in excess of 5,000 BTU/lb, while producing a reusable by-product, the method comprising the steps of:

feeding the hazardous waste material to a large particle shredder for shredding the solid component of the waste material to pieces having a particle size in the range from about ¼ inches to 1 inches, the solid hazardous waste material being intermixed with an inlet stream of recycled flammable fuel of a known BTU content the BTU content being at least about 10,500 BTU/lb;

transporting the liquid-solid mixture by means of a primary screw conveyor, via a primary dissolving tank, to a small particle shredder, the bulk of the liquids and dissolved solids in the liquid-solid mixture being deposited in the primary dissolving tank while the undissolved solids are fed to the small particle shredder, the primary dissolving tank being provided with a mechanical agitator for agitating the contents thereof to produce a near homogeneous mixture of dissolved solids and combined fuel;

passing the homogeneous, flammable mixture from the secondary dissolving tank to a storage tank;

introducing a portion of the stored flammable mixture from the storage tank back to the shredder as the inlet stream of recycled, flammable fuel;

adjusting the flow of stored flammable mixture entering the shredder to provide a homogeneous, flammable mixture in the dissolving tank having a minimum BTU content of at least about 10,500 BTU/lb;

introducing a cement raw feed material into a conventional rotary cement kiln;

firing the conventional cement kiln by introducing into the kiln the flammable mixture from the storage tank and cement raw feed material;

controlling the relative proportion of flammable fuel and cement raw material to obtain a cement clinker of selected final quality;

recovering the cement clinker of selected final quality from the kiln.

4,964,915

SIZING COMPOSITION, A METHOD FOR THE PREPARATION THEREOF AND A METHOD OF USE

Tony Blixt, Helsingborg, and Philip Hakansson, Solvesborg, both of Sweden, assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Jun. 8, 1989, Ser. No. 364,049

Claims priority, application Sweden, Jun. 22, 1988, 8802355

Int. Cl.[5] C09D *103/02, 103/12;* D21H *19/12*

U.S. Cl. 106—210 **11 Claims**

1. A sizing composition in the form of an aqueous emulsion comprising a hydrophobic cellulose-reactive sizing agent and a cationic polymer comprising a starch, characterized in that the starch possesses a combination of (A) an amylopectin content of at least 85% and (B) a degree of substitution of about 0.045 to 0.40.

4,964,916

ANTI-STATIC VARNISH COMPOSITIONS

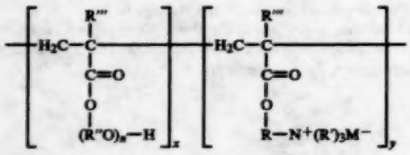
Robert Catena, Orange, N.J., assignor to Sun Chemical Corporation, Fort Lee, N.J.

Division of Ser. No. 378,356, Jul. 11, 1989, Pat. No. 4,931,522. This application Mar. 22, 1990, Ser. No. 497,948

Int. Cl.[5] C08L *67/00, 91/00*

U.S. Cl. 106—228 **19 Claims**

1. A antistatic varnish composition containing up to 50 wt; so of a copolymer of a salt of a quaternized acrylate and a polyalkylene glycol acrylate having the formula:



wherein:
n=5–20;
x=6–13;
y=20–30;
R=an alkylene group of 1 to 5 carbon atoms;
R′=hydrogen or an alkyl group of 1 to 5 carbon atoms;
R″=an alkylene group of 1 to 5 carbon atoms;
R‴=hydrogen or an alkyl group of 1 to 5 carbon atoms; and
M⁻=said copolymer having a number average molecular weight in the range of 4,000 to 7,000.

4,964,917

METHODS AND COMPOSITIONS FOR RECLAIMING CONCRETE

Gregory S. Bobrowski, Chagrin Falls; Gregory C. J. Guecia, Painesville; David A. Lupyan, Chagrin Falls, and Frederick D. Kinney, Broadview Heights, all of Ohio, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 88,180, Aug. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 900,489, Aug. 26, 1986, abandoned. This application Mar. 8, 1990, Ser. No. 494,876

Int. Cl.[5] C04B *16/00*

U.S. Cl. 106—804 **21 Claims**

1. A method for reclaiming concrete which comprises the steps of:
1. retarding the hydration of the concrete to be reclaimed by adding a retarding amount of a retarding agent comprising at least one phosphonic acid derivative, to the concrete in a container; and
2. at the end of the desired retardation period, adding a hydration accelerating agent to the retarded concrete in the container, to restore it to a settable state.

2. A method for reclaiming concrete which comprises the steps of:
1. retarding the hydration of the concrete to be reclaimed by adding a retarding amount of a retarding agent comprising at least one phosphonic acid derivative to the concrete in a ready-mix container; and
2. at the end of the desired retardation peroid, adding a hydration accelering agent to the retarded concrete in the ready-mix container, to restore it to a settable state.

4,964,918

GROUTING COMPOSITION

Richard K. Brown, and Robert W. Stichman, both of Billings, Mont., assignors to Wyo-Ben, Inc., Billings, Mont.

Filed Aug. 12, 1988, Ser. No. 238,422

Int. Cl.[5] C04B *28/00*

U.S. Cl. 106—811 **24 Claims**

1. A reswellable grouting composition which, when mixed with water, is useful for effecting a seal in an earthen borehole or other subsurface cavity, wherein the composition consists essentially of 90.0–99.9% water swellable clay and 0.1–10.0% thinner, wherein the thinner comprises at least one member selected from the group consisting of phosphates, polyphosphates, organophosphates, phosphonates, tannins, ligonites, leonardite, lignosulfonates, and polyacrylates having a molecular weight of less than about 10,000, where the percentages are by weight of the composition prior to mixing with water.

4,964,919

CLEANING OF SILICON WAFERS WITH AN AQUEOUS SOLUTION OF KOH AND A NITROGEN-CONTAINING COMPOUND

Charles C. Payne, Aurora, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Dec. 27, 1988, Ser. No. 291,129

Int. Cl.[5] B08B *3/08*; C11D *7/06, 7/32, 7/34*

U.S. Cl. 134—2 **2 Claims**

1. A composition of matter for cleaning silicon IC wafers consisting essentially of an aqueous solution of about 10% by weight potassium hydroxide and 2.5% by weight of a nitrogen-containing compound selected from the group consisting of tetramethylammonium hydroxide and taurine.

2. A method of cleaning silicon wafers comprising the steps of immersing the wafer in a solution claimed in claim 1; afterwards rinsing and drying the wafer.

4,964,920

METHOD OF REMOVING DEPOSITS OF TIN, LEAD OR TIN/LEAD ALLOYS FROM COPPER SUBSTRATES AND COMPOSITIONS FOR USE THEREIN

Brian Jackson, Bourne End, and Gary Burnett, Slough, both of England, assignors to Imasa Limited, Slough Berks, United Kingdom

Filed Dec. 15, 1989, Ser. No. 451,054

Int. Cl.[5] C23G *1/02*; C09K *13/06*

U.S. Cl. 134—3 **13 Claims**

1. A composition for removing a layer of a metal selected from the group consisting of tin, lead and tin/lead alloy from a copper substrate, said composition comprising an aqueous solution of nitric acid and ferric nitrate wherein said solution also contains anthranilic acid.

4,964,921

METHOD AND APPARATUS FOR CLEANING CHIMNEYS

Kerry W. Lloyd, 10919 E. 56th St., Indianapolis, Ind. 46236

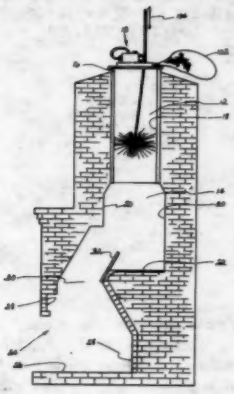
Filed May 12, 1989, Ser. No. 350,914

Int. Cl.[5] B08B *5/04*; A47L *5/12*

U.S. Cl. 134—21 **13 Claims**

1. A method of cleaning chimneys comprising steps of exhausting air up the chimney at a predetermined rate, cleaning the flue of said chimney by brushing said flue, loosening dust and both small and larger particles from said flue, exhausting said dust and small particles with said air, dropping said larger particles into the lower portion of said chimney of said chimney, cleaning said lower portion of said chimney by brushing, loosening dust and both small and larger particles from said

lower portion, exhausting said dust and small particles from said lower portion with said air, dropping said larger particles



onto the bottom of said lower portion, and removing said particles from said lower portion.

4,964,922

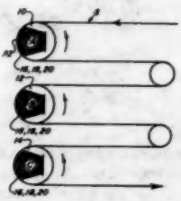
METHOD FOR DOMAIN REFINEMENT OF ORIENTED SILICON STEEL BY LOW PRESSURE ABRASION SCRIBING

S. Leslie Ames, Sarver, and Jeffrey M. Breznak, New Kensington, both of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Jul. 19, 1989, Ser. No. 382,366

Int. Cl.[5] H01F *1/04*

U.S. Cl. 148—111 **10 Claims**



1. In a method of heat-proof domain refinement of grain-oriented silicon steel in the form of a final texture annealed sheet having a layer of insulation coating on its outer surface, the steps of:

abrading said layer of the sheet in a manner to form a predetermined pattern of spaced parallel stripes,

said abrading including the step of applying a relatively low pressure air-liquid abrasive mixture sufficient to remove said layer with substantially no surface damage to the metal as evidenced by minimal effects on magnetic properties, said abrasive mixture comprises a liquid and an abrasive propelled by air pressure of up to 100 psi.

4,964,923

METHOD OF FORMING A COPPER FILM ON A CERAMIC BODY

Yukihisa Takeuchi, and Tetsuo Watanabe, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jun. 27, 1986, Ser. No. 879,356

Claims priority, application United Kingdom, Jul. 26, 1985, 8518945

Int. Cl.[5] C23C *8/10*

U.S. Cl. 148—276 **6 Claims**

1. A method of forming a copper film on a ceramic body comprising the steps of:

depositing a film containing copper oxide on said ceramic body;

heating said film and said ceramic body at a temperature between 400° C. and 1200° C. in a non-reducing atmosphere to bond said film to said ceramic body, thereby resulting in a ceramic substrate having a metal oxide film bonded thereto;

depositing a metal film consisting essentially of copper on said metal oxide film; and

heating said metal film and said ceramic substrate at a temperature up to 1083° C. in a non-oxidizing atmosphere.

4,964,924

SUCTION ROLL MADE OF A MARTENSITIC STAINLESS STEEL

Akira Yoshitake, and Motoki Sakashita, both of Hirakata, Japan, assignors to Kubota Corporation, Osaka, Japan

Filed Jun. 5, 1989, Ser. No. 361,179

Int. Cl.[5] C22C *38/42, 38/44*

U.S. Cl. 148—325 **1 Claim**

1. A suction roll adapted for use in a paper-making process and made of a martensitic stainless steel having high corrosion fatigue strength and high corrosion resistance, said steel consisting of, by weight, over 0 to not greater than 0.06% of C, over 0 to not greater than 2.0% of Si, over 0 to not greater than 2.0% of Mn, 3.0 to 6.0% of Ni, about 16 to 17% of Cr, 1 to 3% of Mo, 0.5 to 1.5% of Cu, and the balance Fe and inevitable impurities.

4,964,925

MEDICAL IMPLANT MADE OF A STAINLESS STEEL ALLOY

Carl P. U. Hagenfeldt, Estoril, Portugal, and Annika M. Roos, Sandviken, Sweden, assignors to Sandvik AB, Sweden

Filed Apr. 3, 1989, Ser. No. 332,178

Claims priority, application Sweden, Apr. 21, 1988, 8801474

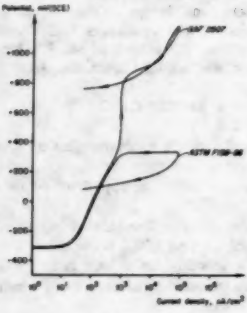
The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.

Int. Cl.[5] C22C *38/44*

U.S. Cl. 148—325 **2 Claims**

1. An implant having good corrosion resistance in physiological environments including a body-liquid containing about 0.9% NaCl solutions at 37° C. comprising, a stainless steel alloy with ferritic-austenitic structure containing in weight percent, max 0.05% C, 23–27% Cr, 5.5–9.0% Ni, 0.25–0.40% N, max

0.8% Si, max 1.2% Mn, 3.5–4.9% Mo, max 0.5% Cu, max 0.5% W, max 0.010% S, up to 0.5% V, up to 0.18% Ce, the



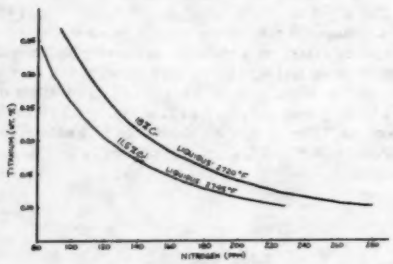
balance Fe and normal impurities, in which the ferrite content is 30–55%.

4,964,926

FERRITIC STAINLESS STEEL

James B. Hill, Natrona Heights, Pa., assignor to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Division of Ser. No. 94,461, Sep. 8, 1987, Pat. No. 4,834,808. This application Dec. 15, 1988, Ser. No. 284,888
Int. Cl.[5] C22C *38/26, 38/28*
U.S. Cl. 148—325 12 Claims



1. A weldable ferritic stainless steel sheet or strip having improved surface substantially free of open surface defects and elevated temperature oxidation resistance and strength, the steel consisting essentially of, by weight percent, up to 0.03 carbon, 0.012 up to 0.05 nickel, 10 to 25 chromium, up to 1.0 manganese, up to 0.5 nickel, up to 1.0 silicon, 0.03 to 0.35 titanium, 0.10 to 0.6 niobium, optionally up to 1.2 aluminum, balance essentially iron, the titanium and nitrogen present up to maximum amounts which vary inversely and not more than necessary to satisfy the following Equation 1:

$$6.194 - \frac{16437}{T} - \log \% N + \log \% Ti + \log + f_N + \log f_{Ti}$$

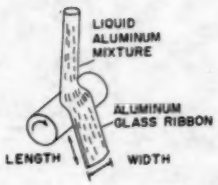
where $\log f_N$ is described in Equation 2 $\log f_{Ti}$ is described in Equation 3, the sheet or strip being substantially free of titanium intermetallic and nonmetallic precipitates.

4,964,927

ALUMINUM-BASED METALLIC GLASS ALLOYS

Gary J. Shiflet; S. Joseph Poon, and Yi He, all of Charlottesville, Va., assignors to University of Virginia Alumni Patents

Filed Mar. 31, 1989, Ser. No. 330,891
Int. Cl.[5] C22C *21/00*
U.S. Cl. 148—403 6 Claims



1. A metallic glass aluminum based alloy of the formula $Al_{85\text{-}90}$ $(X,Z)_{15\text{-}10}$ where X=Fe, Co, Ni, Rh and Z=rare earths, and Hf, wherein the alloys are formed by arc-melting the elements in an argon atmosphere and forming the melt in a helium atmosphere and rapidly cooling the alloy to produce a single-phase amorphous aluminum rich alloy with high flexibility and high strength.

4,964,928

PLOW DISC BLADE DECORATIVE ARTICLE

Martha Wieman, and Mark Wieman, both of 272 Yaupon Cove, Livingston, Tex. 77351

Filed Sep. 13, 1989, Ser. No. 406,448
Int. Cl.[5] B23K *7/00*
U.S. Cl. 148—9 R 33 Claims

1. A method of manufacturing a decorative article from a plow disc replacement blade, consisting of an anterior convex surface and a posterior concave surface, comprising the steps of:

conditioning said convex surface of said plow disc blade;

drawing the periphery of a figure on said convex surface;

framing said figure by forming a border therearound;

cutting said figure and said border with a plasma torch;

removing conditioning means from said convex surface;

abrading said surfaces of said border and said figure;

heat treating said plow disc blade to color said convex surface thereof;

air cooling said plow disc blade to render said colors permanent;

cleansing said surfaces of said plow disc blade to eliminate any residual oils, salts and moisture; and

sealing said surfaces from air to prevent oxidation.

4,964,929

PREPARATION OF EXPLOSIVES CONTAINING DEGRADATION PRODUCTS OF ASCORBIC OR ISOASCORBIC ACID

Paul Beyeler, Arlesheim, and Claude Fürbringer, Riehen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 122,102, Nov. 18, 1987, abandoned. This application Aug. 17, 1989, Ser. No. 395,379

Claims priority, application Switzerland, Nov. 27, 1986, 4741/86

Int. Cl.[5] C06B *21/00*

U.S. Cl. 149—109.6 4 Claims

1. A process for producing an explosive composition comprising the steps of:

a. heating ascorbic acid or isoascorbic acid in the absence of a nitrate containing substance at a temperature between about 70° C. and about 210° C. until about 10 to about 100 percent of the acid is degraded, forming a degradation product; and then

b. at a temperature of less than about 40° C. mixing a nitrate-containing oxidization agent with said degradation product to form the explosive composition.

4,964,930

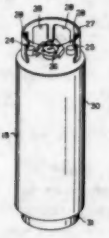
ELECTRICALLY INSULATED FUEL TANK FOR HOT AIR BALLOON AND METHOD OF CONSTRUCTING SAME

Sidney H. Coun, 139 N. Mulberry St., Statesville, N.C. 28677

Continuation of Ser. No. 80,293, Jul. 31, 1987, abandoned. This application Apr. 10, 1989, Ser. No. 336,501

Int. Cl.[5] B32B *31/00*; B65D *25/38*

U.S. Cl. 156—85 7 Claims



1. A method of insulating a propane hot air ballcon fuel tank to prevent transmission of electric current through the tank by contact of the tank with a source of current, and penetration of the tank by arcing of electric current from a spaced apart current source and the tank, said method comprising:

(a) providing an electrically insulative dielectric material in sheet form;

(b) placing the sheet of insulative material over the outer surfaces of the tank; and

(c) bonding the sheet of insulative material to the outer surface of the tank.

4,964,931

TIRE BEAD SETTER APPARATUS AND METHOD

Ralph D. Ring, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 4, 1989, Ser. No. 333,107

Int. Cl.[5] B29D *30/48*

U.S. Cl. 156—131 8 Claims

1. A method of holding and positioning a tire bead ring on a bead setter applier assembly for placing said tire bead ring around a tire casing on an expandable tire building drum having a drum axis coincident with a central axis of said applier assembly wherein said applier assembly has an annular frame member, a plurality of clamp segments pivotally mounted on said frame member at spaced-apart positions around an opening in said frame member, a plurality of magnetic segments pivotally mounted on said frame member at spaced-apart positions around said opening in overlapping relation to said clamp segments; each of said magnetic segments being rotatable about an axis parallel to said central axis of said bead setter applier assembly and each of said magnetic segments having a smooth bead engaging surface in a plane perpendicular to said central axis whereby said bead ring held on said bead engaging surface is maintained in a plane perpendicular to said axis, and means for rotating said clamp segments and said magnetic segments radially inward and outward on said frame member comprising:

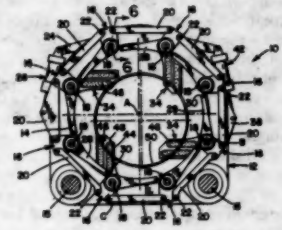
(a) rotating said magnetic segments radially inward to radially inward positions;

(b) placing a bead ring on said bead engaging surface of each of said magnetic segments;

(c) rotating said clamp segments radially inward into engagement with said bead ring to position said bead ring in a location concentric with said central axis of said applier assembly and hold said bead ring in said location;

(d) rotating said magnetic segments radially outward sliding said bead ring off said smooth bead engaging surface and leaving said bead ring supported evenly and concentrically by said clamp segments; and

(e) rotating said clamp segments radially outward after said tire casing is expanded into contact with said bead ring so that said bead setter applier assembly can be moved away from said drum.



2. A bead setter applier assembly for placing a tire bead ring around a tire casing on an expandable tire building drum having a drum axis coincident with a central axis of said applier assembly comprising an annular frame member, a plurality of clamp segments pivotally mounted on said frame member at spaced-apart positions around an opening in said annular frame member, a plurality of magnetic segments pivotally mounted on said frame member at spaced-apart positions around said opening in overlapping relations to said clamp segments, each of said magnetic segments being rotatable about an axis parallel to said central axis of said bead setter applier assembly and each of said magnetic segments having a bead engaging surface in a plane perpendicular to said central axis whereby said bead ring held on said bead engaging surface is maintained in a plane perpendicular to said axis, a first means for rotating said magnetic segments radially inward into a bead holding position for retaining a bead ring placed over said magnetic segments, a second means connected to said clamp segments for rotating said clamp segments radially inward into engagement with said bead ring for positioning said bead ring in a location concentric with said central axis of said bead setter applier assembly, said first means being connected to said magnetic segments radially outward to retract said magnetic segments from said bead ring while said clamp segments are in engagement with said bead ring and slide said bead ring off said smooth bead engaging surface leaving said bead ring supported evenly and concentrically and said second means being connected to said clamp segments for moving said clamp segments radially outward after said tire building drum has been expanded to seat said

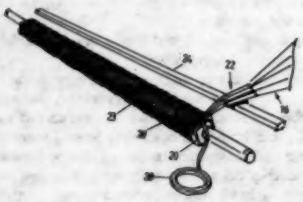
bead ring on said tire casing whereby said bead setter applier assembly can be moved away from said drum.

4,964,932

METHOD AND APPARATUS FOR MANUFACTURING DECORATIVE GARLAND

Leonard G. D. Miller, Victoria, Australia, assignor to Xmas-Mil Display Products Pty. Ltd., Victoria, Australia

Filed Jul. 22, 1988, Ser. No. 223,044
Claims priority, application Australia, Jul. 22, 1987, PI3256
Int. Cl.[5] A47G *33/04*
U.S. Cl. 156—174 **9 Claims**



1. A method of manufacturing decorative garland including:
a winding step in which one or more strips of material are fed to an elongated rotatable mandrel having a longitudinal axis, the or each strip of material making one or more passes in the direction of the longitudinal axis as the mandrel is rotated so that the or each strip of materia! is wound onto the mandrel so as to form a wound bundle comprising one or more layers;
a securement step which includes securing a length of tape having adhesive on both sides lengthwise of the mandrel to the material wound onto the mandrel after each pass and making at least one more pass so that the material is fixed to both sides of the tape;
a cutting step in which the wound bundle is cut from the mandrel by cutting along one edge thereof in the direction of the longitudinal axis so that the wound bundle can be removed from the mandrel and is in the form of an elongated band comprising a plurality of laterally extending strands which extend generally laterally with respect to the longitudinal axis, the strands being held together in the band by virtue of the tape applied during the binding step.

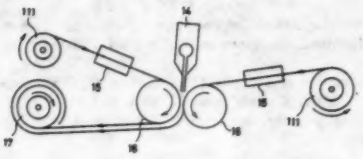
4,964,933

METHOD FOR PRODUCING AN INSULATING POLYOLEFIN LAMINATED PAPER

Ryosuke Hata; Shosuke Yamanouchi; Masayuki Hirose, all of Osaka; Hidemitsu Kuwabara; Yasuharu Mizumoto, both of Shizuoka, and Yasuhiro Hagiuda, Shizuoka, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 196,403, May 20, 1988, Pat. No. 4,859,804, which is a division of Ser. No. 927,984, Nov. 7, 1986, Pat. No. 4,762,965, which is a division of Ser. No. 649,004, Sep. 10, 1984, Pat. No. 4,673,607. This application Apr. 14, 1989, Ser. No. 337,998
Claims priority, application Japan, Sep. 9, 1983, 58-167082
Int. Cl.[5] B29C *47/06*; B32B *31/08*
U.S. Cl. 156—209 **5 Claims**

1. A method for producing an insulating polyolefin laminated paper, comprising the steps of:
providing first and second fiber paper layers having an impermeability of 20 to 4000 Gurley-seconds, at least one of said first and second fiber paper layers being mechanically deformed prior to lamination in such a manner that irregularities thereon have a depth of 2 to 50% of the thickness of said at least one fiber layer;
controlling the water content of said first and second fiber paper layers immediately before lamination to maintain said water content at no more than 4%, said fiber paper layers having a thickness of at least 30 microns; and



laminating said first and second fiber layers to a molten and extruded polyolefin layer.

4,964,934

OPTICAL DISK MANUFACTURING PROCESS

David P. Gregg, Culver City, Calif., assignor to Del Mar Avionics, Irvine, Calif.

Filed Feb. 2, 1989, Ser. No. 305,109
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—219 **12 Claims**

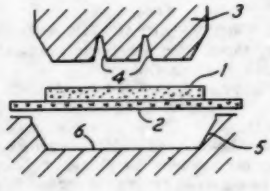
1. A laminating flow process for manufacture of second surface optically recordable media, comprising the steps of:
providing a continuous flow of substratum;
covering said substratum with a first adhesive lamina;
applying a continuous flow of an optically reflective lamina to said first adhesive lamina;
covering said reflective lamina with an optically active lamina to form a first surface optically recordable composite lamina;
coveriug said active lamina with an optically transparent, second adhesive lamina;
sequentially applying molded, optically transparent, ultra violet inhibiting covers to said second adhesive lamina to form a second surface optically recordable lamina, comprising multiple second surface optically recordable media;
compressing and embossing each said cover into said active lamina; and
severing said multiple second surface optically recordable media from said composite lamina to form individual second surface otpically recordable media.

4,964,935

METHOD OF MAKING FIBRE REINFORCED THERMOPLASTICS MATERIAL STRUCTURE

Ian S. Biggs, Hughenden Valley, and Bronislaw Radvan, Flackwell Heath, both of England, assignors to The Wiggins Teape Group Limited, Basingstoke, England

Continuation of Ser. No. 78,172, Jul. 27, 1989, abandoned. This application Aug. 3, 1989, Ser. No. 390,452
Claims priority, application United Kingdom, Jul. 31, 1986, 8618726
Int. Cl.[5] B29C *43/02*
U.S. Cl. 156—242 **20 Claims**



1. A method of making a fibre reinforced plastics structure

having a plurality of layers, including a first layer which is fully consolidated with uniformly dispersed fibres and a second layer which is formed as an absorbent matrix from a first sheet of fibre reinforced thermoplastics material which will consolidate when cooled after subjection to pressure at a temperature above the melt temperature of the thermoplastics material of said first sheet of a second sheet of fibre reinforced thermoplastics material which will remain porous when cooled after subjection to pressure at a temperature above the melt temperature of the thermoplastics material of the second sheet, comprising the steps of:

(i) heating said first and second sheets to a temperature above that at which the thermoplastics materials of both of said sheets are caused to melt, and

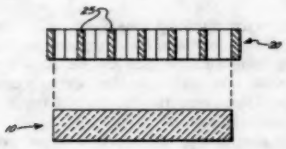
(ii) subjecting said first and second sheets, whilst in surface contact, to pressure in a mould; wherein said first and second sheets bond together in conformity with the shape of the mould and form a laminated moulding having a fully consolidated first layer and a second layer at least a portion of which remains porous.

4,964,936

METHOD OF MAKING FOAM-FILLED CELLULAR STRUCTURES

Gregory A. Ferro, Hoffman Estates, Ill., assignor to Imi-Tech Corporation, Elk Grove Village, Ill.

Filed Oct. 11, 1988, Ser. No. 255,447
Int. Cl.[5] B29C *43/18*
U.S. Cl. 156—242 **33 Claims**



1. A process of forming a composite polyimide foam-containing article which comprises:

(i) exposing cured polyimide foam to an atmosphere of steam at an elevated pressure so that said foam is converted into a body of non-flexible, non-resilient, recurable cellular material;

(ii) pressing said body of non-flexible, non-resilient, recurable cellular material into a structure having a plurality of walls defining a plurality of laterally spaced open cells so that said open cells are at least partially filled with said recurable cellular material; and

(iii) heating said recurable cellular material to cause it to cure while contained within said structure to form said composite polyimide foam-containing article.

4,964,937

THIN FILM ADHERING METHOD AND THIN FILM ADHERING APPARATUS

Mitsuhiro Seki, Tokyo, Japan, assignor to Somar Corporation, Tokyo, Japan

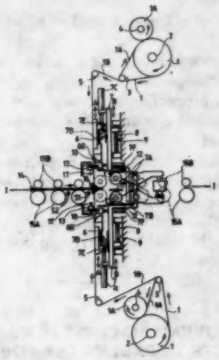
Filed Sep. 22, 1989, Ser. No. 410,787
Claims priority, application Japan, Sep. 22, 1988, 63-237869
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—250 **9 Claims**

1. A thin film adhering apparatus in which a thin film whose length corresponds to that of a substrate is adhered to the thin film adhering side of said substrate by a pressure adhering roller, comprising:

a substrate conveyance mechanism for conveying said substrate to a thin film adhering position and for moving said substrate from said position;

a thin film feed member for adhering the leading edge portion of the continuous thin film and supplying said leading edge portion to said adhering position;

a thin film leading edge portion holding member disposed proximate said adhering position, said holding member having a holding side which comes into surface contact with the leading edge portion of said film supplied to said position said holding side having thin film suction holes communicating with a vacuum suction system for suction-



ing the leading edge portion of said film onto said holding side, said continuous film held in said position by said holding member being adhered to the thin film adhering side of said substrate from the leading edge portions of said film and said substrate to the trailing edge portions thereof by said roller; and

a cutter for cutting said continuous film at the trailing edge portion thereof to said length corresponding to that of said substrate.

4,964,938

BONDING METHOD USING PHOTOCURABLE ACRYLATE ADHESIVE CONTAINING PERESTER/TAUTOMERIC ACID ADHESION PROMOTER

Andrew G. Bachmann, Harwinton, and James M. Hillman, Torrington, both of Conn., assignors to Dymax Corporation, Torrington, Conn.

Filed Apr. 13, 1987, Ser. No. 37,464
Int. Cl.[5] C08F *2/50, 4/34*
U.S. Cl. 156—273.7 **12 Claims**

1. In a method for bonding surfaces to one another, the steps comprising:

(a) providing a liquid composition capable of reaction to an adhesive solid when exposed to actinic radiation, comprising a major proportion of at least one polymerizable acrylate monomer and an elastomeric domain-providing filler, an effective amount of an actinic radiation-responsive photoinitiator and, based upon the weight of said composition, about 1.0 to 5.0 percent of a perester compound having free radical-initiating capability and about 0.5 to 5.0 percent of an organic acid capable of cyclic tautomerism, said composition being free from stabilizers containing sulfur or the amine functionality;

(b) applying said composition to at least one of the surfaces to be bonded, and effecting contact of another surface therewith; and

(c) exposing said composition between said surfaces to actinic radiation for a period of time sufficient to effect curing of said composition to an adhesive solid.

4,964,939

LABELING METHOD EMPLOYING STARCH-BASED ADHESIVE FORMULATION CONTAINING ROSIN COMPOSITION

Patrick D. Gleason, St. Paul, Minn., assignor to H. B. Fuller Company, St. Paul, Minn.

Division of Ser. No. 129,176, Dec. 7, 1987, Pat. No. 4,804,414.
This application Aug. 31, 1988, Ser. No. 239,527
Int. Cl.[5] C09J 3/02
U.S. Cl. 156—336 23 Claims

1. A method of adhering a label to a container which comprises:

(a) forming an adhesive layer on a flexible label, said adhesive comprising:

(i) a major proportion of water;

(ii) an effective amount of a starch to form an adhesive bond; and

(iii) an effective cleaning facilitating amount of a neutralization product of an alkali metal base and a wood or a hydrocarbon rosin composition having an acid number greater than about 140; and

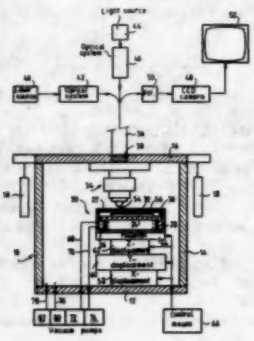
(b) adhering the label to a beverage container through the adhesive layer.

4,964,940

LASER MICROBEAM MACHINE FOR ACTING ON THIN FILM OBJECTS, IN PARTICULAR FOR CHEMICALLY ETCHING OR DEPOSITING SUBSTANCE IN THE PRESENCE OF A REACTIVE GAS

Geoffroy Auvert, Grenoble; Jean-Claude Georgel, Lambesc, and Yves Guerin, Pourrieres, all of France, assignors to Etat Fracais, France

Filed Nov. 24, 1989, Ser. No. 440,789
Claims priority, application France, Nov. 25, 1988, 88 15435
Int. Cl.[5] B44C 1/22; C23F 1/02; C23C 14/00; B23K 9/00
U.S. Cl. 156—345 11 Claims



1. A laser microbeam machine for acting on thin film objects, in particular for chemically etching or depositing material in the presence of a reactive gas, the machine including a laser source, a microscope objective lens pointing towards the thin film object, and optical means for transmitting the laser beam from the source to the microscope lens, the machine comprising:

a reaction chamber formed essentially by a sealed box closed by a thin transparent lid and intended to receive the thin film objects and the reactive gas;

a sealed enclosure in which the reaction chamber and the microscope lens are housed, with the lens being carried by one of the walls of said enclosure;

suction means for reducing pressure simultaneously both in the reaction chamber and in the enclosure; and

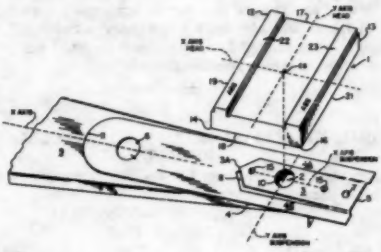
means for inserting a reactive gas at low pressure into the reaction chamber.

4,964,941

APPARATUS FOR MOUNTING A MAGNETIC HEAD ON A SUSPENSION ARM

Kim Von Brandt, Boulder; Bruce L. Blakeslee, Golden; John Keil, Jr., Lakewood, and Robert D. Stroud, Boulder, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Division of Ser. No. 221,673, Jul. 20, 1988, Pat. No. 4,866,836.
This application Aug. 16, 1989, Ser. No. 394,569
Int. Cl.[5] B32B 31/12
U.S. Cl. 156—360 9 Claims



1. Apparatus for mounting a magnetic read/write head onto a suspension assembly arm having mounting identification indicia comprising a dimple, said arm having adhesive applied thereto adjacent said dimple, said apparatus comprising;

means for determining the location of the center of said dimple on said arm,

means for determining the location of the center of said head,

means for rotating said arm in a horizontal plane so that a longitudinal axis of said head is parallel to a longitudinal axis of said arm,

means for positioning said arm so that said center of said head is immediately over said center of said dimple,

means for lowering said head onto said arm while said center of said head remains over said center of said dimple, and

means for permanently affixing said head to said dimple by applying heat to a bottom of said dimple for the time required to heat said dimple and said arm to bond said adhesive.

4,964,942

ADHESIVE TAPE APPLICATOR

Masaaki Tsuda, Yokohama, Japan, assignor to Kabushiki Kaisha Takara, Osaka, Japan

Filed Apr. 25, 1989, Ser. No. 343,141
Int. Cl.[5] B31B 1/72, 7/60
U.S. Cl. 156—468 2 Claims

1. An adhesive tape applicator, comprising:

an adhesive tape supply means for supplying an adhesive tape having adhesive on one side;

a foil tape supply means for supplying a foil tape having a foil on one side;

a hammer anvil positioned below a package carrying path and a hammer positioned in opposed relation to said hammer anvil and hammer drive means for intermittently causing said hammer to strike said hammer anvil;

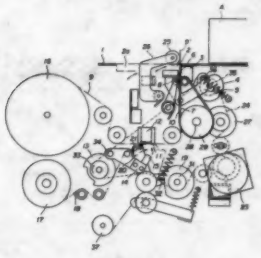
a tape supplying means located below the package carrying path for intermittently feeding adhesive tape from said adhesive tape supply means and foil tape from said foil tape supply means over said hammer anvil with the adhesive on said adhesive tape and the foil on said foil tape against each other for being struck by said hammer for

transferring hit portions of said foil on said foil tape onto the adhesive of said adhesive tape;

a tape feeding means for feeding said adhesive tape having said foil portions thereon vertically upwardly through said package carrying path;

cutting means along a path along which adhesive tape is fed by said tape feeding means for cutting said fed tape at a boundarys between said foil portions and adhesive on said tape; and

a tape application roller along said package carrying path downstream relative to the package movement direction from the position at which said adhesive tape has been fed



upwardly through said package carrying path and movably mounted for movement between a tape application position in which it is above said package carrying path and a retracted position in which it is retracted below said package carrying path, said adhesive tape with a foil portion thereon projecting above said package carrying path being struck by a package moving along said package carrying path and carrying said projecting adhesive tape against said tape application roller for causing said tape application roller to roll down the front of the package and along the bottom of the package as the package passes the position of the tape application roller for rolling the adhesive tape against a corner of the package.

4,964,943

DEVICE FOR THERMALLY JOINING ENDS OF CONVEYOR BELTS

Manfred Krüger, and Franz-Erich Schulte Strathaus, both of Unna, Fed. Rep. of Germany, assignors to F. E. Schulte Strathaus KG

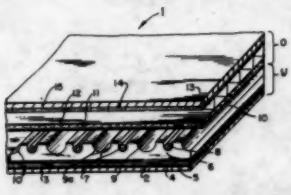
PCT No. PCT/DE87/00195, § 371 Date Jan. 7, 1988, § 102(e) Date Jan. 7, 1988, PCT Pub. No. WO87/06876, PCT Pub. Date Nov. 19, 1987

PCT Filed May 2, 1987, Ser. No. 155,715

Claims priority, application Fed. Rep. of Germany, May 10, 1986, 3615879

Int. Cl.[5] B29C *43/32*; B30B *15/06*

U.S. Cl. 156—498 **11 Claims**



1. A device for heat bonding at least two conveyor belt ends, with pressure plates having heating and cooling elements on their insides, comprising sectional aluminum bars arranged inside each plate, defining longitudinal heating channels and cooling channels wherein at least some of the channels are connected with each other in end regions thereof arc-shaped channels and wherein each sectional aluminum bar has at least one said heating channel for receiving a heating element and at least one said coating channel being spatially seperated from the one said heating channel.

4,964,944

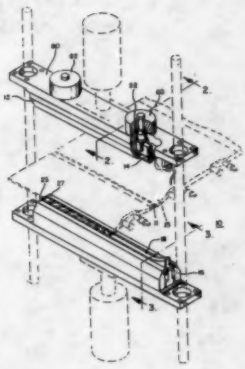
APPARATUS FOR SEALING AND SEVERING A WEB OF FILM

William C. Christine, Catasauqua, Pa.; Steffen Lyons, Libertyville, Ill.; John Posey, McHenry, Ill.; Schmidt, Josef, Libertyville, Ill., and George J. Herschman, Bath, Pa., assignors to Baxter International Inc., Deerfield, Ill.

Filed Jul. 28, 1986, Ser. No. 889,714

Int. Cl.[5] B32B *31/18*

U.S. Cl. 156—515 **25 Claims**



1. An apparatus for sealing and severing a web of film comprising:

a first jaw located on a first side of the web of film;

a second jaw located on a second side of the web of film;

the first and second jaws cooperating to grip the web of film; and

means for sealing and contemporaneously severing the web of film located within the first jaw, including means for varying independent of the first jaw the pressure, at which the means for sealing and contemporaneously severing engages the web of film.

4,964,945

LIFT OFF PATTERNING PROCESS ON A FLEXIBLE SUBSTRATE

Clyde D. Calhoun, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 9, 1988, Ser. No. 281,655

Int. Cl.[5] B44C *1/22*; C25F *3/02*; H05K *3/06*

U.S. Cl. 156—632 **19 Claims**

1. A method of making a patterned deposit on a flexible substrate comprising the steps of:

providing a flexible, sheet-like substrate and integral with at least a portion of one major surface of said sheet a first, etchable masking material which stiffens the flexible substrate and defines physical protrusions generally normal to said surface of said substrate; and

depositing over at least a portion of the masked region a second, pattern material chemically different from said first material, said second, pattern material being deposited primarily on said exposed substrate and mask surfaces

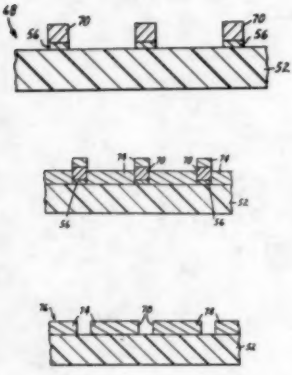
which are parallel to the plane of said major surface of said substrate,;

controlling said deposition so that said mask material is not completely covered or sealed; and

applying a chemical agent to selectively etch away said first masking material whereby a pattern of said second material remains on said substrate.

15. A method of making articles having a shape corresponding to a pre-selected pattern comprising the steps of:

providing a substrate and covering at least a portion of said substrate with a first, etchable masking material integral with said substrate, and which includes physical protrusions normal to said surface of said substrate,



depositing on at least a portion of the masked region a second, pattern material chemically different from said first masking material, said second pattern material being deposited primarily on said first masking material which is parallel to the surfaces of said substrate; and

discontinuing said deposition before all of said masking material is completely covered; and

applying a chemical agent to selectively etch away said first masking material underneath said pattern material whereby said pieces of said pattern material are released from said substrate.

4,964,946

PROCESS FOR FABRICATING SELF-ALIGNED FIELD EMITTER ARRAYS

Henry F. Gray, and George J. Campisi, both of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1990, Ser. No. 473,752

Int. Cl.[5] B44C *1/22*; C23F *1/02*; C03C *15/00, 25/06*

U.S. Cl. 156—643 **12 Claims**

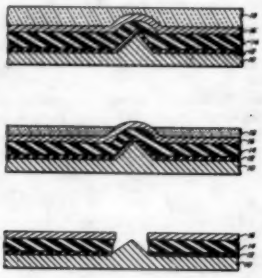
1. A process for fabricating self-aligned field emitter arrays which includes the steps of:

depositing a dielectric layer on top of an array of field emitters;

depositing a thin conducting film over the dielectric layer;

applying a planarization layer on the thin conducting film by a self-levelling process;

selectively etching the planarization layer until the underlying conducting film is exposed in regions surrounding the field emitters, thereby defining grid apertures; and



selectively etching the conducting film and dielectric layer sequentially to a depth sufficient to expose a field emitter cathode tip at each field emitter site.

4,964,947

METHOD OF MANUFACTURING DOUBLE-SIDED WIRING SUBSTRATE

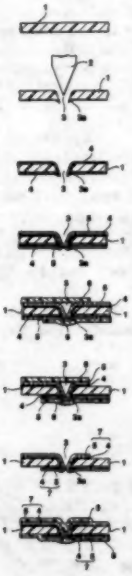
Yoshio Yarita, and Yoshihiro Kawamura, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jan. 12, 1990, Ser. No. 464,410

Claims priority, application Japan, Jan. 20, 1989, 1-11366; Jan. 30, 1989, 1-20623

Int. Cl.[5] B44C *1/22*; C23F *1/02*; C03C *15/00, 25/06*

U.S. Cl. 156—645 **5 Claims**



1. A method of manufacturing a double-sided wiring substrate comprising the steps of:

forming a hole in an insulating film by a pin;

forming a thin metal film on upper and lower surfaces of said insulating film and an inner wall of the hole by deposition;

forming a thick metal film on said thin metal film by plating; and

etching a predetermined portion of said thin and thick metal films formed on said upper and lower surfaces of said insulating film to form a conductive patterns having a layered structure of said thin and thick metal films, said conductive patterns extending from said inner wall of the hoe to said upper and lower surfaces of said insulating film.

4,964,948

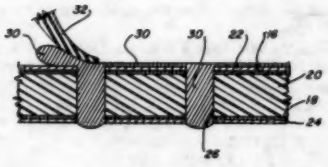
PRINTED CIRCUIT BOARD THROUGH HOLE TECHNIQUE

Ronald G. Reed, Monument, Colo., assignor to ProtoCAD, Inc., Colorado SPrings, Colo.

Division of Ser. No. 172,199, Mar. 23, 1988, Pat. No. 4,911,796, which is a continuation-in-part of Ser. No. 929,390, Nov. 10, 1986, Pat. No. 4,823,277, which is a continuation-in-part of Ser. No. 725,817, Apr. 16, 1985, Pat. No. 4,720,798. This application Nov. 13, 1989, Ser. No. 435,703

Int. Cl.[5] B44C *1/22*; C23F *1/02*; C03C *15/00, 25/06*

U.S. Cl. 156—659.1 **8 Claims**



7. A process for protecting plated through-holes in a conductor sheet-clad board during etching when producing a printed circuit board, comprising:

filling the holes with a radiation curable putty,

curing the putty in the hole by exposing the putty to radiation to form a hole plug,

depositing resist on the hole plug and the adjacent conductor sheet which is clad to the board to describe the desired circuit pattern, and

accomplishing all of the foregoing steps prior to etching the exposed conductor to create the circuit pattern.

4,964,949

DEINKING COMPOSITION FOR RECLAMATION OF WASTE PAPER

Koji Hamaguchi; Fumihiko Togashi, and Yoshitaka Miyauchi, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 33,426, Apr. 1, 1987, abandoned. This application Jun. 22, 1988, Ser. No. 211,172

Claims priority, application Japan, Apr. 11, 1986, 61-83419; Dec. 24, 1986, 61-313874

Int. Cl.[5] D21C *5/02*

U.S. Cl. 162—5 **7 Claims**

1. A deinking composition for reclamation of waste paper, which consists essentially of (a) a reaction product obtained by adding one or more alkylene oxides to a mixture of a natural ol or fat and a polyhydric alcohol and (b) a compound selected from the group consisting of (b-1) an alkylene oxide adduct of a higher alcohol having the formula (1):

$$R—O—AO)_n H \quad (1)$$

in which R is an alkyl or alkenyl having 12 to 18 carbon atoms, AO are units derived from ethylene oxide or ethylene oxide and another alkylene oxide having 3 to 4 carbon atoms and n is 5 or more on the average, (b-2) a sulfate of an alkylene oxide adduct of a higher alcohol having the formula (2):

$$R'—O—A'O)_m SO_3M \quad (2)$$

in which R′ is an alkyl or alkenyl having 10 to 18 carbon atoms, A′O are units derived from ethylene oxide or ethylene oxide and another alkylene oxide having 3 to 4 carbon atoms, m is from 0.3 to 5 on the average and M is hydrogen, an alkali metal or ammonium, mixtures of (b-1) and (b-2), and (b-3) a higher fatty acid having 8 to 22 carbon atoms or a salt thereof, wherein the weight ratio of (a) to (b) ranges from 99/1 to 50/50 when (b) is (b-1), (b-2) or mixtures thereof, and from 95/5 to 30/70 when b is (b-3).

4,964,950

METHOD AND APPARATUS FOR DIVIDING AND UNITING THE FLOWS OF HIGH-CONSISTENCY FIBRE SUSPENSIONS

Toivo Niskanen, Hamina, and Voitto Reponen, Karhula, both of Finland, assignors to A. Ahlstrom Corporation, Karhula, Finland

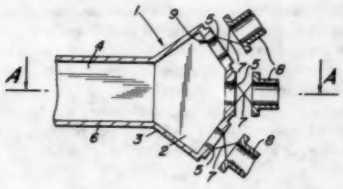
PCT No. PCT/FI86/00005, § 371 Date Aug. 20, 1986, § 102(e) Date Aug. 20, 1986, PCT Pub. No. WO86/04369, PCT Pub. Date Jul. 31, 1986

PCT Filed Jan. 20, 1989, Ser. No. 898,204

Claims priority, application Finland, Jan. 24, 1985, 850307

Int. Cl.[5] F16L *55/18*

U.S. Cl. 162—100 **4 Claims**



1. A method for dividing and uniting flows of high consistency fibre suspensions, comprising:

supplying the fibre suspension, having a consistency of between 5%–20% to a vortex chamber having a distributor space therein with at least one inlet opening and a plurality of outlet openings for uniting inlet and outlet flows through the distributor space, said inlet and outlet openings being spaced from each other;

providing a plurality of outlet channels each connected to one of said outlet openings and extending outwardly from said distributor space;

providing said distributor space with an inner surface around each outlet opening which forms an edge in said surface between said outlet opening and said outlet channel connected to that outlet opening which is sharp and substantially non-rounded;

creating turbulent flow by means of angularly disposed interior surfaces in the distributor space so that the fibre suspension is subjected to shear forces for dividing the fibre suspension for flow out of said outlet openings, and

positioning each valve at a distance of less than one-half the diameter of an outlet opening away from said distributor space.

4,964,951

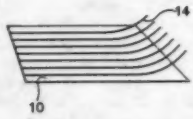
PROCESS FOR MAKING SECURE PAPER PRODUCT

William R. Menyhert, St. Petersburg Beach, Fla., assignor to Security Tag Systems, Inc., St. Petersburg, Fla.

Division of Ser. No. 56,495, May 29, 1987, Pat. No. 4,835,028. This application Apr. 13, 1989, Ser. No. 337,340

Int. Cl.[5] D21H *21/40*

U.S. Cl. 162—140 5 Claims



1. A process for making a paper product from which images cannot be copied by use of a xerographic photocopier that reproduces an image defined by print on the paper product by a process that includes sensing light received from the paper product upon the paper product being exposed to high intensity light within a predetermined portion of the light spectrum that is absorbed by the print, said paper making process comprising the steps of

(a) mixing paper ingredients with a material selected from a group consisting of materials that totally absorb light within said predetermined portion of the light spectrum so that no light is received from the paper product by the light sensing means of the photocopier; and

(b) processing the mixture of step (a) to provide a sheet of the mixture wherein step (a) comprises mixing the paper ingredients with a said selected material having light absorption characteristics that are dependent upon the orientation of such material with respect to incident light, wherein said selected material is uniformly oriented in a medium that can be oriented in accordance with the orientation of an applied electric field; and

further comprising the step of

(c) applying an electric field during step (b) to orient said selected material to provide a paper product having selected light absorption characteristics.

4,964,952

METHOD OF CONTROLLING PITCH USING A CATIONICALLY MODIFIED TANNIN

John J. Bennison, Runcorn, and Richard P. Clifford, Great Sutton, both of England, assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Apr. 28, 1988, Ser. No. 187,628

Claims priority, application United Kingdom, May 1, 1987, 8710448

Int. Cl.[5] D21F *11/00*; D21H *13/10*

U.S. Cl. 162—158 16 Claims

1. A method of controlling pitch in an aqueous system involved in paper making which uses paper fiber which comprises adding to the system a cationically modified tannin which is derived from (1) a tannin, (2) an amino compound which contains or is capable of generating a primary amino group, and (3) an aldehyde or a compound which is capable of generating an aldehyde group; said cationically modified tannin being added in ana mount effective to control the accumulation of pitch in the paper machine system.

4,964,953

AMPHOTERIC STARCHES AND PROCESS FOR THEIR PREPARATION

Daniel B. Solarek, Bridgewater; Teresa A. Dirscherl, Plainfield; Henry R. Hernandez, Bridgewater, and Wadym Jarowenko, Green Brook, all of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Division of Ser. No. 50,649, May 18, 1987, which is a continuation-in-part of Ser. No. 896,546, Aug. 13, 1986, abandoned. This application Jul. 31, 1989, Ser. No. 386,668

Int. Cl.[5] D21H *17/28*

U.S. Cl. 162—175 8 Claims

1. In a process for making paper, the step which comprises adding to the stock prior to passing the stock onto the wire screen, a non-degraded, non-crosslinked starch derivative containing tertiary amino or quaternary ammonium cationic groups and anionic phosphate groups wherein said starch derivative has a D.S. of cationic groups of from about 0.010–0.080, a viscosity of at least 800 cps as measured on a starch dispersion (2.0% by weight, dry basis) in potassium hydroxide using a Brookfield Viscometer at 10 rpm, a bound phosphorus content of at least 0.12%, and the ratio of anionic to cationic groups is within the range of from about 0.12 to 0.55 moles of phosphate groups per mole of cationic group.

4,964,954

PROCESS FOR THE PRODUCTION OF PAPER

Hans Johansson, Kungälv, Sweden, assignor to Eka Nobel AB, Surte, Sweden

PCT No. PCT/SE88/00063, § 371 Date Oct. 26, 1988, § 102(e) Date Oct. 26, 1988, PCT Pub. No. WO88/06659, PCT Pub. Date Sep. 7, 1988

PCT Filed Feb. 16, 1988, Ser. No. 267,121

Claims priority, application Sweden, Mar. 3, 1987, 8700891; Mar. 25, 1987, 8701252

Int. Cl.[5] D21H *17/45, 17/74*

U.S. Cl. 162—164.6 10 Claims

1. A process for improving the retention of fines and optional fillers and for improving dewatering at the production of paper comprising the forming and dewatering of a suspension comprising papermaking fibers, on a wire,

said forming and dewatering being carried out at a pH above 5 and in the presence of

(a) an anionic inorganic colloid which is present in an amount of from 0.005 to 2 percent by weight based on dry fibers and optional fillers and which is selected from the group consisting of a silica sol, a silica sol with particles which have at least a surface layer of aluminum silicate and an aluminum modified silica sol,

(b) a water-soluble, basic, polyaluminum compound which is present in an amount such that the weight ratio of the polyaluminum compound to the anionic inorganic colloid is from 0.01:1 to 3:1, and

(c) a cationic, synthetic polymeric retention agent which is present in an amount of 0.01 to 3 percent by weight based on dry fibers and optional fibers and which comprises a cationic polyacrylamide or polyethyleneimine.

4,964,955

METHOD OF REDUCING PITCH IN PULPING AND PAPERMAKING OPERATIONS

Richard S. Lamar, Littleton; William E. Pratt, Englewood, both of Colo.; Kenneth E. Weber, North Hollywood, Calif., and Robert E. Roeder, Parker, Colo., assignors to Cyprus Mines Corporation, Englewood, Colo.

Filed Dec. 21, 1988, Ser. No. 287,866

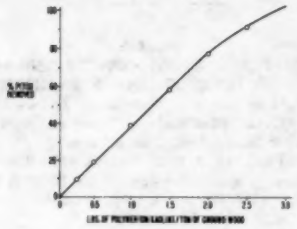
Int. Cl.[5] D21H *17/45, 17/54*

U.S. Cl. 162—164.6 27 Claims

1. A method of reducing pitch in pulping and papermaking operations which comprises:

(1) adding to a pitch-containing furnish a particulate composite substance comprising (a) a water soluble cationic

polymer adsorbed onto (b) an essentially water insoluble particulate substrate, said polymer being sufficiently electropositive so that said composite substance exhibits a zeta potential of at least about +30 mV, and



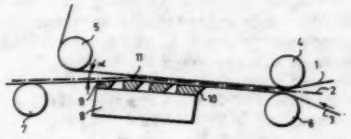
(2) adsorbing pitch onto said composite substance to form discrete, finely dispersed pitch-containing aggregates in said furnish.

4,964,956

METHOD OF AND A DEVICE FOR LEADING A WEB MOVING BETWEEN TWO WIRES ON TO A DESIRED WIRE

Veikko Lamminen; Erkki Hietikko, and Ilpo Kylmäkorpi, all of Tampere, Finland, assignors to Oy Tampella AB, Tampere, Finland

Filed Jun. 13, 1988, Ser. No. 206,230
Claims priority, application Finland, Jun. 30, 1987, 872882
Int. Cl.[5] D21F *9/02*
U.S. Cl. 162—203 **9 Claims**



1. A method of guiding a web onto a desired wire in a paper machine, wherein the web is first guided between a first wire and a second wire so as to contact both wires and to be moved along a length of said wires in a parallel arrangement with said wires, whereafter, the wires are arranged to part abruptly from each other at a parting point by a shoe having a surface which is positioned adjacent to one of said wires; said surface comprises two planes forming a distinct angle and intersecting to form a line in said surface; said line defining said parting point; wherein said wires and said web are arranged to move in said parallel arrangement along one of said planes of said surface and then to part from each other at said parting point; one of said wires is arranged to follow along the other plane of said surface after the parting point so that the direction of travel of one of the wires is abruptly changed at the parting point, and the web is detached from said first wire, and caused to follow the second wire by applying a vacuum, through said second wire, to the web at the parting point.

4,964,957

PURIFICATION OF HIGH BOILING ALKYL SULFIDES

James E. Shaw, and John S. Roberts, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 6, 1988, Ser. No. 280,337
Int. Cl.[5] B01D *3/34*; C07C *319/26*
U.S. Cl. 203—6 **20 Claims**

1. A process for preventing the decomposition of a high boiling dialkyl sulfide compound containing 8 or more carbon atoms when subjected to high temperatures comprising:

combining a basic compound which is non-reactive to said dialkyl sulfide compound in an amount effective to prevent said decomposition with said dialkyl sulfide compound; and

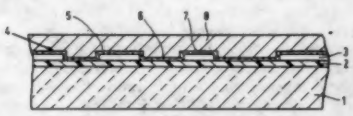
subjecting the resultant mixture to said high temperature.

4,964,958

METHOD OF PRODUCING A METAL MATRIX

Petrus E. J. Legierse, Nuenen, Netherlands; Louis J. M. Beckers, Overpelt, Belgium, and Jeroen F. M. Landsbergen, Best, both of Netherlands, assignors to Phillips & Du Pont Optical Company, New York, N.Y.

Filed Sep. 26, 1989, Ser. No. 412,971
Claims priority, application Netherlands, Oct. 14, 1988, 8802533
Int. Cl.[5] C25D *1/10*
U.S. Cl. 204—5 **5 Claims**



1. A method of producing a metal matrix which can be used in the manufacture of optically readable synthetic resin information carriers, characterized in that a master disc having a substrate and a photoresist layer provided thereon and which has an optically readable information track, is provided at the side having the photoresist layer with an electrolessly deposited gold layer, the gold layer at the side having the resist layer being exclusively in contact with organic material, a first metal peel is applied by electro-deposition on the gold layer, the master disc is separated and thereafter the first metal peel obtained which contains the gold layer is provided at the side coated with the gold layer with a second metal peel, whereafter the first metal peel together with the gold layer is separated.

4,964,959

PROCESS FOR PF "PARING A NONCONDUCTIVE SUBSTRATE FOR ELECTROPLATING

Barry F. Nelsen, Mountain Lakes, N.J., and Jieh-Hwa Shyu, Windham, N.H., assignors to Olin Hunt Specialty Products Inc., Cheshire, Conn.

Filed Apr. 12, 1990, Ser. No. 507,811
Int. Cl.[5] C25D *5/02, 5/54*
U.S. Cl. 204—15 **28 Claims**

1. In the process for electroplating a conductive metal layer to the surface of a nonconductive material, which comprises the following steps:

(a) preparing a liquid dispersion of carbon black comprised of:

(1) carbon black particles having an average particle diameter of less than about 3.0 microns in said dispersion;

(2) an effective dispersing amount of a surfactant which is compatible with said carbon black; and

(3) liquid dispersing medium, wherein the amount of carbon black is sufficient to coat substantially all of said nonconducting surfaces and is less than about 4% by weight of said liquid dispersion;

(b) applying said liquid dispersion to the surface of the nonconducting material;

(c) separating substantially all of said liquid dispersing medium from said carbon black particles, whereby said particles are deposited on said nonconductive surface in a substantially continuous layer; and

(d) electroplating a substantially continuous conductive metal layer over the deposited carbon black layer and said

nonconductive surface, wherein said improvement comprises:

adding an organic ionomer or polymer salt, or combinations thereof, to the liquid dispersion in step (a).

4,964,960

CATION EXCHANGE REINFORCED MEMBRANE AND PROCESS FOR USING

James T. Keating, Wilmington, and Stephen A. Perusich, Newark, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 28, 1989, Ser. No. 316,630

Int. Cl.[5] C25B *1/16, 1/26, 13/08*

U.S. Cl. 204—98 **8 Claims**

1. A carboxyl/sulfonyl bimembrane comprising at least one film layer of a copolymer having sulfonyl groups in melt-fabricable form and at least one film layer of a copolymer having carboxyl groups in melt-fabricable form; at least one said sulfonyl-group layer having adhered therein a fabric reinforcement made from yarn that is oriented and then at least partially hydrolyzed, said yarn being made of a fluorinated cation exchange resin precursor having sulfonyl monomer as functional monomer and in which the mole ratio of a non-functional monomer to said functional monomer in the yarn is 2.8–11.8:1, the sulfonyl layer having a mole ratio of non-functional to functional monomer which differs from that of the yarn by no more than 3 units.

4,964,961

ELUTION METHOD AND DEVICE

Kathe L. Brautigam, St. Petersburg, and William W. Gorman, Jr., Treasure Island, both of Fla., assignors to E-C Apparatus Corporation, St. Petersburg, Fla.

Filed Aug. 2, 1989, Ser. No. 388,494

Int. Cl.[5] C25B *7/00*; C07K *3/14*

U.S. Cl. 204—182.3 **17 Claims**

1. A method for performing electro elution upon a sample, comprising:

(A) providing an elution apparatus comprising:

(a) a tapered tube having a decreased diameter toward an end of the tapered tube and being divided by a porous disc into an open upper section and a lower section which is closable by a removable cap; and

(b) a dialysis membrane of substantially the same diameter as the removable cap and affixed to the removable cap such that the dialysis membrane is sealed against the end of the tapered tube when the removable cap closes the lower section of the tapered tube;

(B) placing the sample within the upper section of the tapered tube; and

(C) applying an electric current through the sample to cause migration of a desired substance from the sample, through the porous disc and into the lower section of the tapered tube.

7. An apparatus for electro elution of components separated by analytical electrophoresis on a gel comprising:

(a) a tapered tube having a decreased diameter toward an end of the tapered tube and being divided by a porous disc into an open upper section and a lower section which is closable by a removable cap; and

(b) a dialysis membrane of substantially the same diameter as the removable cap and affixed to the removable cap such that the dialysis membrane is sealed against the end of the tapered tube when the removable cap closes the lower section of the tapered tube.

4,964,962

METHOD FOR FORMING CONDUCTING METAL LAYER ON INORGANIC SUBSTRATE

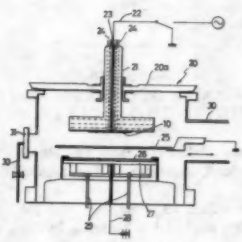
Tohru Nobutani; Atsuhiro Nakamoto; Hideo Izumi, and Takahiro Miyano, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Oct. 3, 1989, Ser. No. 416,406

Claims priority, application Japan, Oct. 8, 1988, 63-254658; Oct. 8, 1988, 63-254659; Oct. 8, 1988, 63-254660; Oct. 8, 1988, 63-254661; Oct. 8, 1988, 63-254662

Int. Cl.[5] C23C *14/34*

U.S. Cl. 204—192.3 **13 Claims**



1. A method for forming a conducting metal layer on an inorganic substrate, the method comprising the steps of providing said inorganic substrate, accommodating the inorganic substrate within a vacuum vessel of a sputtering device, heating within said vacuum vessel the inorganic substrate to a temperature about 140° C. while attaining inside the vacuum vessel a vacuum below 3×10^{-4} Pa, leading into the vacuum vessel a rare gas as a discharge gas under a pressure of 2–20 Pa, applying a high frequency power to said heated inorganic substrate with said heated inorganic substrate made as a target within the vacuum vessel for carrying out an ion bombardment for a predetermined time, interrupting said high frequency power application and regulating said rare gas pressure to 0.2–2.0 Pa, and carrying out a sputtering by applying a DC power to a conducting metal member disposed in the vessel as a target so as form a conducting metal film on the inorganic substrate at a rate above 1.4 μm/min.

4,964,963

METHOD OF MAKING ARCHITECTURAL COATING WITH INTERFERENCE COLORS

Russell C. Criss, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 682,136, Dec. 17, 1984, Pat. No. 4,902,581. This application Dec. 15, 1989, Ser. No. 450,936

Int. Cl.[5] C23C *14/34*

U.S. Cl. 204—192.27 **7 Claims**

1. A method of making a solar energy reflecting coated article comprising the steps of:

a. sputtering stainless steel in an oxidizing atmosphere onto a surface of a substrate to form a first transparent coating which exhibits color by absorption and interference effects; and

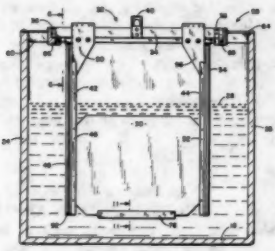
b. sputtering over said film a highly reflective transparent metallic film.

4,964,964

ELECTROPLATING APPARATUS

Timothy I. Murphy, Mahtomedi, Minn., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Apr. 3, 1989, Ser. No. 332,047
Int. Cl.[5] C25D *17/06, 21/12, 17/04*
U.S. Cl. 204—224 R 20 Claims



1. An electroplating apparatus including:

a container, an electrolyte solution within said container for the electroplating of an article suspended within the container, and a body comprised of a plating metal ion source for supplying ions of said plating metal to said electrolyte solution; a substantially rigid electrically conductive support means running substantially the length of a side edge portion of said article, said support means including a proximal portion above said electrolyte solution and a distal portion immersed in said electrolyte solution, and a fastening means along said distal portion for electrically and mechanically securing said support means to said article along said side edge portion;

a mounting means integral with said container and positioned above said electrolyte solution;

a guide means, integral with said support means and near said proximal portion thereof, for releasably engaging said mounting means to suspend said article within said container, with said article immersed in said electrolyte solution for electroplating;

an electrical power supply, and first and second electrically conductive paths connected between said power supply and said support means at respective first and second spaced apart locations along said support means, said first location being at least proximate the proximal portion of the support means and said second location being at least proximate a distal end of the distal portion of the support means, said first and second paths having respective first and second predetermined resistances for selectively determining the amount of electric current carried by each of said first and second paths as compared to the other, for selectively shaping the electrical field proximate said article as a result of the current supplied to said support means from said power supply.

4,964,965

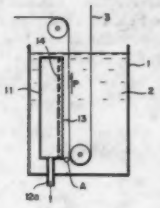
INSOLUBLE ELECTRODE DEVICE FOR TREATMENT OF METALLIC MATERIAL

Hiroshi Nakatsugawa, Yokohama, Japan, assignor to Furukawa Circuit Foil Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 249,833, Sep. 27, 1988, abandoned. This application Jan. 16, 1990, Ser. No. 465,516
Claims priority, application Japan, Oct. 1, 1987, 62-245922; Oct. 1, 1987, 62-245923
Int. Cl.[5] C25D *17/10*
U.S. Cl. 204—280 17 Claims

8. An insoluble electrode device for use in electrolytic treatment of a surface of a metallic material, comprising:

a box which is submerged in a process tank having an electrolyte solution therein, said box having a plurality of faces, one of said faces being an open face, said open face being disposed such that the metallic material which is moving in a predetermined direction in said tank whenever the metallic material is being treated and said open face are opposed to each other with a predetermined spacing therebetween;



an outlet for discharging electrolyte solution, the outlet being on at least one of the other faces of said box;

a porous electrode plate mounted to said open face of said box; and

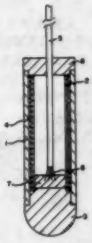
a liquid flow control panel mounted behind said porous electrode plate toward the interior of said box.

4,964,966

ELECTRODE AND CONSTRUCTION THEREOF

Peter J. Moreland, 22 Springbourne, Frodsham Chesire, Great Britain WA6 6QD, and Norman Tattam, 46 Whitchurch Road, Chester, Great Britain CH3 5QB

Filed Feb. 27, 1989, Ser. No. 316,259
Claims priority, application United Kingdom, Mar. 1, 1988, 8804859
Int. Cl.[5] C25B *11/04*
U.S. Cl. 204—280 16 Claims



1. An electrode comprising:

(a) a first structure of low conductivity non-metallic material;

(b) a second structure spaced from said first structure which is made of a material of relatively high conductivity; and

(c) a solid, low-melting point, electrically conducting metal or alloy of bismuth disposed between said first and second structures and in electrical contact therewith.

4,964,967

SURFACE ACTIVATED ALLOY ELECTRODES AND PROCESS FOR PREPARING THEM

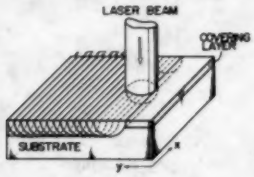
Koji Hashimoto, Izumi; Naokazu Kumagai, Matsudo; Katsuhiko Asami, and Asahi Kawashima, both of Sendai, all of Japan, assignors to Daiki Engineering Co., Ltd., Tokyo and Koji Hashimoto, Miyagi, both of, Japan

Continuation of Ser. No. 98,387, Sep. 18, 1987, abandoned. This application Feb. 16, 1990, Ser. No. 481,718

Claims priority, application Japan, Sep. 22, 1986, 61-222028

Int. Cl.[5] C25B *11/06, 11/08*

U.S. Cl. 204—292 3 Claims



1. Surface activated surface alloy electrodes high in corrosion resistance and activity, comprising:

A. a substrate selected from the group consisting of

(i) a corrosion-resistant metal selected from titanium, zirconium, niobium and tantalum,

(ii) a corrosion-resistant alloy composed of two or more metals selected from titanium, zirconium, niobium and tantalum, and

(iii) (i) or (ii) clad with a corrosion-resistant metal or a corrosion-resistant-alloy, and

B. a solid surface alloy layer on substrate A, said solid surface alloy consisting of 20 to 67 atomic % of one or more metals selected from titanium, zirconium, niobium and tantalum, 0.01 to 10 atomic % of one or more platinum group metals of ruthenium, rhodium, palladium, iridium and platinum, and substantially the remaining amount of nickel and/or cobalt,

and said solid surface alloy containing an amorphous phase of 150 μm or less thickness as a result of being formed by irradiation melting of high energy density beam followed by self quenching; the surface of said solid surface alloy being activated by surface roughening and enrichment of platinum group elements as a result of immersion in corrosive solution capable of dissolving nickel, cobalt, titanium, zirconium, niobium and tantalum selectively.

4,964,968

MAGNETRON SPUTTERING APPARATUS

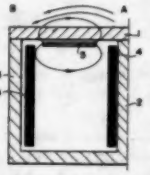
Yoji Arita, Yokohama, Japan, assignor to Mitsubishi Kasei Corp., Japan

Filed Mar. 9, 1989, Ser. No. 321,210

Claims priority, application Japan, Apr. 30, 1988, 63-105476; Oct. 15, 1968, 63-258365; Dec. 19, 1988, 63-318464; Dec. 19, 1988, 63-318465

Int. Cl.[5] C23C *14/35*

U.S. Cl. 204—298.19 16 Claims



1. A magnetron sputtering apparatus comprising:

an inner magnetic pole;

an outer magnetic pole arranged to surround the inner magnetic pole and having a polarity opposite to that of the inner pole;

a target disposed at least above the inner magnetic pole and extending therefrom towards the outer magnetic pole; and

a gradient adjusting means, mounted underneath the target in the magnetic field formed between the inner and outer magnetic poles, for adjusting the gradient of the component of the leakage magnetic field vertical to the target, in such a manner that the gradient above the target is reduced at a middle portion of the upper surface of the target between the inner and outer magnetic poles, and the gradient is increased near the side end portions of the upper surface of the target near the inner and outer magnetic poles.

4,964,969

SEMICONDUCTOR PRODUCTION APPARATUS

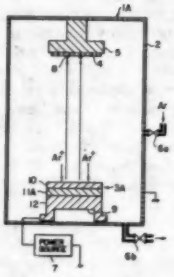
Kenji Kusakabe, and Keiji Yamauchi, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 11, 1989, Ser. No. 405,432

Claims priority, application Japan, Jun. 9, 1989, 1-145091

Int. Cl.[5] C23C *14/34*

U.S. Cl. 204—298.12 2 Claims



1. A semiconductor producing apparatus comprising:

a chamber;

means for supporting a semiconductor wafer in said chamber;

means for supporting a semiconductor wafer in said chamber;

a target disposed in said chamber opposite said means for supporting a semiconductor wafer; and

means for ionizing a gas charged in said chamber and causing the gas ions to impinge upon and sputter said target wherein said target has a backing plate, a metal target, and a solder layer through which said backing plate and said metal target are bonded together wherein said solder layer is an alloy consisting of 10 to 40wt% of zinc (Zn), up to 5 wt% of tin (Sn), up to 8 wt% of aluminum (Al), up to 0.2 wt% of impurities, and the balance substantially of cadmium (Cd).

4,964,970

COMPACT LOW VOLUME WATER PURIFICATION APPARATUS

Harry O'Hare, Thousand Oaks, Calif., assignor to HOH Water Technology Corp., Newbury Pk., Calif.

Filed Oct. 5, 1988, Ser. No. 253,624

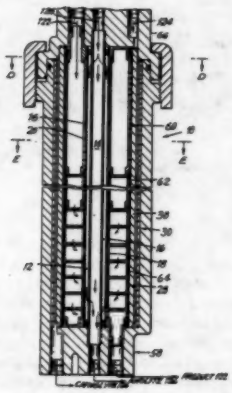
Int. Cl.[5] B01D *61/48*

U.S. Cl. 204—301 19 Claims

1. A compact water purifier comprising:

(a) an anode having a fluid passageway through its interior to provide an anode fluid path;

(b) a anionic membrane support member concentrically mounted about said anode;
(c) a anionic membrane mounted to the exterior of said anionic support member;
(d) a separating means for maintaining a first fluid passageway between said anionic membrane and said anode;
(e) a bead box concentrically mounted about said anionic membrane support member to provide a water purification path;
(f) ion exchange resins located in said bead box for contact with the water in said water purification path;
(g) fluid communication means between said water purification path and said anionic membrane;
(h) a cationic membrane concentrically mounted about said bead box;



(i) fluid communication means between said water purification path and said cationic membrane;
(j) a cathode concentrically mounted about said cationic membrane;
(k) a separating means for maintaining a passageway between said cationic membrane and said cathode to define a second fluid passageway therebetween;
(l) means to provide an anolyte waste stream through said anode fluid path and through said first fluid passageway;
(m) means to provide a catholyte waste stream through said second fluid passageway;
wherein ionic impurities are removed from the water purification path by the combined action of electrodialysis and ion exchange resins.

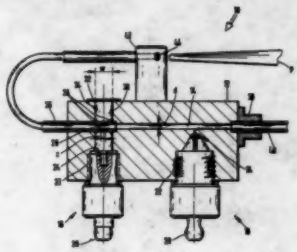
4,964,971

LIQUID ANALYZER

Werner H. Riemann, Heinrich-Heine-Strasse 26, D-3550 Marburg (Lahn), Fed. Rep. of Germany

Filed Apr. 12, 1988, Ser. No. 180,459
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1987, 8705520[U]
Int. Cl.[5] G01N *27/416*
U.S. Cl. 204—403 **20 Claims**

1. A device for electrochemically analyzing a body fluid which includes in combination
(a) a frame (52),
(b) module (10) on said frame (52), said module including a measuring line (14) containing a channel for the body fluid and at least one measuring electrode (18) and at least one reference electrode (16),
(c) a carrier (80, 46) containing a plurality of measuring pads (48),
(d) means for the controlled movement of said carrier (80, 46) towards said measuring line (14) and pressing it against said measuring line (14) and



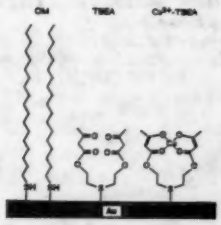
(e) means for moving the said carrier (80) back and forth relative to the measuring line (24) when the measuring pads are out of contact with the measuring line (14).

4,964,972

IONIC RECOGNITION AND SELECTIVE RESPONSE IN SELF ASSEMBLING MONOLAYER MEMBRANES ON ELECTRODES

Jacob Sagiv, Ness Ziona; Israel Rubinstein, Rishon-le-Zion; Suzi Steinberg, Rehovot; Abraham Shanzer, Rehovot, and Yitzhak Tor, Rehovot, all of Israel, assignors to Yeda Research and Development Company Limited, Rehovot, Israel

Filed Mar. 30, 1989, Ser. No. 330,508
Int. Cl.[5] G01N *27/333*
U.S. Cl. 204—418 **11 Claims**



1. An electrode for use in electrochemical sensing devices wherein said electrode comprises a non specific electrically conducting metal substrate on which there is a self-assembled monolayer which contains an active species specific component and a blocking surface sealing component.

4,964,973

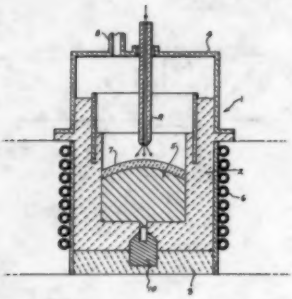
METHOD AND APPARATUS FOR PRODUCING TITANIUM

Raymond J. Donahue, Fond du Lac; William G. Hsterberg, Rosendale, and Terrance M. Cleary, Allenton, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 258,035, Oct. 14, 1988, Pat. No. 4,875,985. This application Aug. 8, 1989, Ser. No. 391,132
Int. Cl.[5] C25C *3/28, 7/00*
U.S. Cl. 204—64 T **19 Claims**

1. A method of producing titanium, comprising the steps of heating a quantity of titanium to a temperature above the melting point thereof to produce a melt, providing a layer of a slag containing an ionized titanium compound and slag constituents on the top of said melt, heating said slag to a molten state,

and subjecting the melt to direct current plasma arc heating with said melt being cathodic to reduce said titanium com-



pound at the interface between said slag and said melt to produce titanium, said titanium being combined with said melt.

4,964,974

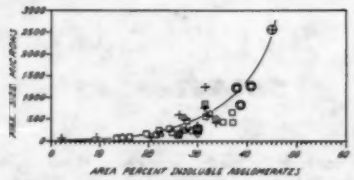
MICROSCOPIC EXAMINATION OF EBULLATED BED PROCESS EFFLUENT TO CONTROL SEDIMENT

Glenn A. Clausen, Nederland; Karen A. Kuhn, Port Arthur, and Kathryn P. Weldon, Sour Lake, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 269,529, Nov. 10, 1988, abandoned. This application Nov. 20, 1989, Ser. No. 438,274

Int. Cl.[5] C10G *47/26*

U.S. Cl. 208—108 **6 Claims**



1. A method for hydrocracking a residual hydrocarbon oil by treating the oil with hydrogen in the presence of a particulate catalyst in an ebullated bed, the steps comprising:

(a) passing the residual oil, and a hydrogen-containing gas upwardly through an ebullated bed of the catalyst in a hydrocracking zone at a reaction temperature in the range of 750° to 875° F. and pressure in the range of about 1500 psig to 10,000 psig thereby forming a hydrocracked product,

(b) withdrawing a sample of the hydrocracked product, and

(c) forming a 60X to 175X magnified view of the sample by means of a microscope,

(d) measuring the area percent covered by insoluble agglomerates of the magnified view of the sample,

(e) controlling the reaction temperature to maintain a selected area percent covered by insoluble agglomerates in the range of 37 to 45 area percent, thereby

(f) reducing plugging in downstream equipment due to insoluble agglomerates.

4,964,975

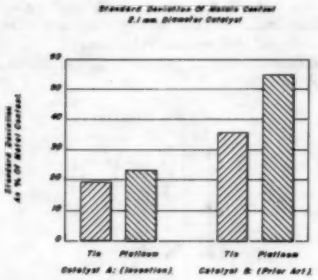
REFORMING CATALYST WITH HOMOGENEOUS METALS DISPERSION

Tai-Hsiang Chao, Mt. Prospect; William M. Targos, Palatine, and Mark D. Moser, Elk Grove Village, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed Jun. 30, 1989, Ser. No. 374,384

Int. Cl.[5] C10G *35/085*

U.S. Cl. 208—139 **2 Claims**



1. A process for the catalytic reforming of a hydrocarbon feed which comprises contacting the hydrocarbon feed with a bed of extruded catalyst particles, comprising a combination of a refractory inorganic oxide support with about 0.1 to 10 mass % on an elemental basis of a halogen component, about 0.01 to 2 mass % on an elemental basis of a platinum-group metal component, and about 0.1 to 2 mass % on an elemental basis of a tin component, wherein the standard deviation of the local concentration of tin is less than about 25% of the bulk concentration of tin, at reforming conditions.

4,964,976

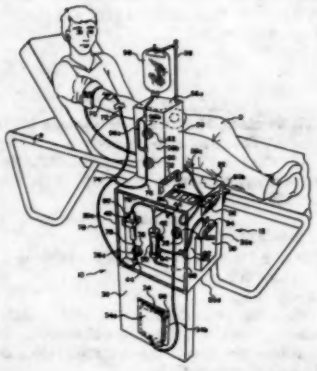
OPTIMIZED FILTER AND METHOD

Michael J. Lysaght, 25400 Barsumian, Tower Lakes, Barrington, Ill. 60010; Daniel R. Boggs, 308 Amherst Ct., and Philip L. Ritger, 8 Parkside #4, both of Vernon Hills, Ill. 60061

Continuation of Ser. No. 333,851, Apr. 4, 1989, abandoned, which is a continuation of Ser. No. 919,347, Oct. 15, 1986, abandoned. This application Feb. 1, 1990, Ser. No. 473,142

Int. Cl.[5] B01D *61/14, 61/24, 63/02*

U.S. Cl. 210—650 **2 Claims**



1. In a blood filtration system comprising

a hollow fiber membrane device for separating filtrate from

blood comprising a housing having a blood inlet port, a blood outlet port, and a filtrate outlet port, the membrane device including a preselected number (N) of hollow fiber membrane elements carried within the housing, each element having a preselected length (L) and a preselected internal diameter (D), and

apparatus associated with the hollow fiber membrane device for conveying blood having a determinable hematocrit (H_i) and viscosity (μ) from a source through the blood inlet and outlet ports of the membrane device to therein separate filtrate from the blood and for conveying the filtrate from the filtrate outlet port of the membrane device, the apparatus including

first means for establishing a flow rate (Q_i) of blood through the blood inlet port of the membrane device,

second means for establishing a flow rate (Q_f) of filtrate from the filtrate outlet port of the membrane device, and

third means for conveying filtrate-poor blood from the blood outlet port of the membrane device,

a method of operating the system subject to a selected safety factor for red blood cell hemolysis (HSF) comprising the step of simultaneously obtaining the following performance relationships:

Performance Relationships(1) $Q_f = K_1 Q^x N^{(1-x)} L^{(1-y)} D^{(1-3x)}$

where

$K_1 = 0.0002206\ [\ln (95/Hi)]^z H^{(1-x)} (8/15)^x$ and

$x = 0.9141$;

$y = 0.3619$;

$z = 0.8528$;

Q is the average blood flow rate through the device defined as the blood flow rate through the blood inlet port (Q_i) minus one-half the filtrate flow rate through the filtrate outlet port, or $Q_i - Q_{f/2}$; and

H_i is the hematocrit (expressed in %) of the blood entering the blood inlet port of the device;

Performance Relationship (2)

$$Q = \frac{K_2 P N D^4}{\mu (L + L_p)}$$

where

μ is the blood viscosity function $= 3.236206/[(1 - H_i)/100^{1.440442}]$;

L_p is the potting length of the fibers, expressed in cm;

P is the pressure drop across the device expressed in mmHg; and

$$K_2 = \frac{(\pi)}{(128)} \times$$

(the applicable conversion factor for consistent units);

and

Performance Relationship (3)

$$HSF = \frac{(TMP)_h}{P - (-20\ \text{mmHg})}$$

where

$$(TMP)_h = \frac{(3.51 \times 10^{-9}\ \gamma_{w,h}^3 - 0.00003\ \gamma_{w,h}^2 + 0.0976\ \gamma_{w,h} + 4.75)}{r_p};$$

r_p is the average pore radius of the membrane; (−20 mmHg) is the assumed filtrate collection chamber pressure; and

$$\gamma_{w,h} = \frac{8Q}{15\ ND^3 \pi}$$

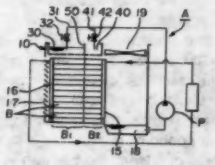
is the shear rate for hemolysis.

4,964,977

CROSS-FLOW TYPE COOLING TOWER

Jujiro Komiya, Fujisawa, and Tadanobu Muto, Tokyo, both of Japan, assignors to Shinwa Sangyo Company, Ltd., Tokyo, Japan

Filed Apr. 7, 1989, Ser. No. 334,554
Claims priority, application Japan, Apr. 8, 1988, 63-86935
Int. Cl.[5] B01F 3/04
U.S. Cl. 261—130 **12 Claims**



1. A cross-flow type cooling tower which comprises:

a cooling tower main body,

a water tank placed at the upper part of the main body,

a plurality of closed type heat exchanging units arranged in the main body in a substantially horizontal manner and in parallel to each other in multi-stage below the water tank,

a supplying header placed near an air discharge opening of the main body, which is detachably connectable to supplying ports of the heat exchanging units,

an intake header placed near an air discharge opening of the main body, which is detachably connectable to discharge ports of the heat exchanging units, wherein the water tank is divided into at least two parts: a first water receiving part near the air intake opening and a second water receiving part near the air discharge opening by means of a partition wall, and a switching valve is provided at at least a water feeding pipe to the second water receiving part.

4,964,978

FORMING OF FELTS WHICH HAVE AN ISOTROPIC STRUCTURE

Alain Debouzie, Couronne; Francois Bouquet, Rantigny, and Alain De Meringo, Paris, all of France, assignors to Isover Saint-Gobain, Courbevoie, France

Filed Jul. 9, 1984, Ser. No. 629,062
Claims priority, application France, Jul. 7, 1983, 83 11344
Int. Cl.[5] D04H 1/44
U.S. Cl. 264—119 **9 Claims**

1. A method for the continuous forming of felts from fibres of a glass material coated with a binder composition and distributed onto a receiving member retaining the fibres, and subsequently heat treated to cross-link the binder composition and to fix the structure of the felt, comprising: between formation on the receiving member and its heat treatment, subjecting the felt to at least two succesive longitudinal compression operations, the rate of which, defined by the ratio of fibre mass per unit of surface area after compression to that prior to compression, is limited to a value less than that at which creases might form which would affect the faces of the felt.

4,964,979

METHOD FOR SUPPRESSING THE DEHYDROGENATION ACTIVITY OF DEPOSITED METALS ON INERT SOLIDS IN HEAVY OIL PRETREATMENT

Ashok S. Krishna, 4925 Sunlight Ct., Concord, Calif. 94518, and Ramamoorthy Periaswamy, 3732 Morningside Dr., El Sobrante, Calif. 94830

Continuation of Ser. No. 106,485, Oct. 6, 1987, abandoned. This application Aug. 7, 1989, Ser. No. 391,062
Int. Cl.[5] C10G *29/04*
U.S. Cl. 208—253 13 Claims

1. A process for the pretreatment of hydrocarbon oil feed which comprises contacting a hydrocarbon feed containing metal contaminants, including nickel, with an inert, sorbent material in a fluidized reactor zone and regenerating said sorbent in a regeneration zone, with circulation of said sorbent between the reactor zone and said regeneration zone, so that the two zones operate as an integrated system; the improvement which comprises:

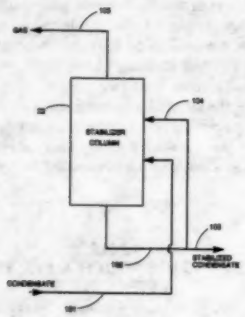
introducing said sorbent into said process, wherein said sorbent contains a composition for mitigating the dehydrogenation reactions caused by the deposition of the contaminant metals on the inert sorbent material during heavy oil pretreatment, said composition comprising a bismuth compound or mixtures of bismuth compounds, in a weight ratio of introduced bismuth to nickel equivalents of between about 0.01:1 and about 1:1.

4,964,980

APPARATUS AND PROCESS FOR STABILIZING LIQUID HYDROCARBON CONDENSATE

Terry B. McCarthy, Katy, Tex., assignor to Amoco Corporation, Chicago, Ill.

Filed Jul. 27, 1988, Ser. No. 224,859
Int. Cl.[5] C10G *5/00*
U.S. Cl. 208—340 7 Claims



1. A method for stabilizing condensate from a CO_2 recovery plant comprising the steps of:

(a) introducing said condensate, at an elevated temperature and pressure, into a stabilizer column operated under conditions effective to separate said condensate into (i) a liquid portion which is a stabilized condensate comprising $n-C_4+$ hydrocarbons, and (ii) a gaseous portion, which comprises CO_2 and normally gaseous hydrocarbons;

(b) withdrawing said liquid portion, (i), from said stabilizer and dividing it into a stabilized condensate product stream that is recovered and a recycle stream that is cooled and the cooled recycle stream is reintroduced as liquid feed into said stabilizer column; and

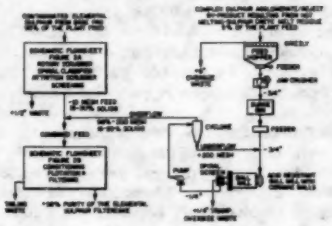
(c) withdrawing said gaseous portion, (ii), from said stabilizer column.

4,964,981

RECOVERY OF ELEMENTAL SULPHUR FROM PRODUCTS CONTAINING CONTAMINATED ELEMENTAL SULPHUR BY FROTH FLOTATION

Ion I. Adamache, Calgary, Canada, assignor to Canterra Energy Ltd., Calgary, Canada

Division of Ser. No. 14,975, Feb. 17, 1987, Pat. No. 4,871,447.
This application Jan. 25, 1989, Ser. No. 220,668
Claims priority, application Canada, Feb. 20, 1986, 502290
Int. Cl.[5] B03D *1/02, 1/10*
U.S. Cl. 209—166 19 Claims



1. A process for recovery by froth flotation of elemental sulphur in the oil and gas industry and in other industries from a complex sulphur agglomerate, reject by-product of hot melting processes also known as sulphur crete melt residue, said process comprising the steps of:

(a) coarse screening said reject complex sulphur agglomerate to form a coarse screened undersize fraction, and crushing the said coarse undersize fraction utilizing a jaw crusher;

(b) wet grinding said coarse screened and crushed fraction utilizing a ball mill, thus forming a milled slurry with particles in the slurry being finer than 48 mesh with a substantial amount of said particles being finer than 100 or 200 mesh;

(c) size classifying the milled slurry for return of an oversize fraction to the wet grinding apparatus, and adjusting the undersize fraction to approximately 15–20% solids;

(d) conditioning said adjusted undersize fraction slurry from step (c) with at least two classes or reagents including frother reagents and regulating/dispersing reagents;

(e) subjecting the conditioned slurry-reagent composition resulting from step (d) to at least three stages of froth flotation—a rougher flotation stage and at least two cleaner stages—to produce an elemental sulphur concentrate; and,

(f) recovering the elemental sulphur by filtering and dewatering the resultant elemental sulphur concentrate.

4,964,982

MAIL STACKER

Gerhard Goldkuhle, and Günter Süssnapp, both of Konstanz, Fed. Rep. of Germany, assignors to Licentia-Patent-Verwaltungs-GmbH, Frankfurt, Fed. Rep. of Germany

Filed May 19, 1989, Ser. No. 354,270
Int. Cl.[5] B07C *1/04*
U.S. Cl. 209—539 3 Claims

1. A stacker for articles of mail and similar flat, flexible conveying material, comprising:

a conveying path on which the articles are transported individually, said conveying path including a primary

conveying path portion having an upstream end and a downstream end, and a secondary conveying path portion diverging from said first conveying path portion at said upstream end and merging with said primary conveying path portion at said downstream end;

a compartmented path disposed along said conveying path downstream of said primary and secondary conveying path portions and including switches and stack compartments for sorting articles;

a reading device located along said conveying path upstream of said primary and secondary conveying path portions for detecting two successive articles to be assigned to the same stack compartment;

a switch located at the upstream end of said primary conveying path portion for diverting one of two successive articles assigned to the same stack compartment to said secondary conveying path portion and for allowing the other of the two successive articles to be transported by the primary conveying path portion, said secondary conveying path portion being configured in at least one of length and transporting speed so that when the one article is returned to the conveying path at the downstream end of the primary conveying path portion, the two articles are further transported partially overlapping each other.

4,964,983

RESERVOIR

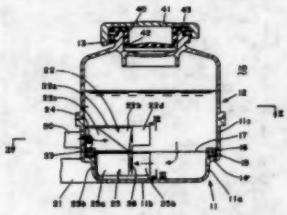
Ryutaro Abe, Toyokawa; Yoshiyuki Takeuchi, Gamagori, and Kouichi Shibata, Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 13, 1989, Ser. No. 434,258

Claims priority, application Japan, Nov. 21, 1988, 63-294181

Int. Cl.[5] B01D *33/00*

U.S. Cl. 210—168 **5 Claims**



1. A reservoir for reserving oil comprising:

a reservoir body provided with an inlet and an outlet formed at different locations;

a first filter disposed between said inlet and said outlet for filtering oil flowing from said inlet to said outlet;

a first guide member for forcing the oil flowed into through said inlet to flow toward said first filter; and

a second guide member for forcing the oil passed through said first filter to flow toward said outlet.

4,964,984

BLOOD FILTER

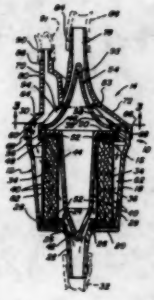
Gary D. Reeder, Morrison, and Michael J. Janicki, Aurora, both of Colo., assignors to Electromedics, Inc., Englewood, Colo.

Filed Jun. 14, 1989, Ser. No. 366,645

Int. Cl.[5] B01D *19/00, 27/04, 27/08*

U.S. Cl. 210—188 **8 Claims**

1. In a blood filter device for removing gas bubbles from a flow of blood wherein said blood filter has a lower body including a filter medium and an outlet through which blood can flow and an upper body through which the blood passes en route to the lower body, wherein the improvement comprises a cap forming the upper body of the device and being hermetically sealed to the lower body and establishing fluid communication therebetween, said cap having a vertically oriented blood inlet tube, a debubbling chamber in communication with the inlet tube and with the lower body, a vent opening establishing communication between the debubbling chamber and an external environment, and a sloped upper wall of the debubbling chamber passing around the inlet tube, said sloped upper wall defining an inclined arched downwardly concave channel passing around the inlet tube, a lowermost edge of said inlet tube lying beneath the uppermost extent of said arched channel



except at a single point location, and wherein the vent opening is positioned in the arched channel at the highest point thereof whereby gas bubbles released from the blood in the debubbling chamber will be encouraged to flow along said arched channel for removal from the device through said vent opening, said device further including a dispersion plate in alignment with the inlet opening for distributing the blood into said debubbling chamber.

4,964,985

LIQUID CHROMATOGRAPH

David P. Goulder, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 94,579, Sep. 9, 1987, abandoned. This application May 19, 1989, Ser. No. 355,124

Claims priority, application United Kingdom, Sep. 17, 1986, 8622326

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—198.2 **9 Claims**

1. A liquid chromatograph comprising

(a) a plurality of sources of solvent,

(b) a reciprocating piston pump,

(c) proportioning valve means connected between said sources of solvent and an inlet of said pump for feeding solvent to said pump,

(d) control means for controlling said proportioning valve means in response to a selected mixture combination of said solvent input to said pump,

said control means controlling said proportioning valve means by serially connecting individual solvents from said

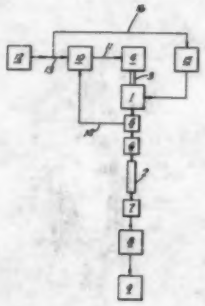
proportioning valve means to said inlet of said pump on a return stroke of at least one piston of said pump,

(e) first means for connecting an outlet of said pump to an inlet of a separating column,

(f) second means for connecting an outlet of said separating column to a detector structure,

said control means further comprising

third means for determining time intervals for connecting each individual solvent to said inlet of said pump,



fourth means for producing control signals to cause valves of said proportioning valve means to operate during said time intervals, and

fifth means for controlling said proportioning valve means to obtain a selected solvent composition by averaging components of said individual solvents over a plurality of piston cycles to increase a minimum time interval for connecting each given solvent to said inlet of said pump above a level such that fluid accelerations and deaccelerations are minimized.

4,964,986

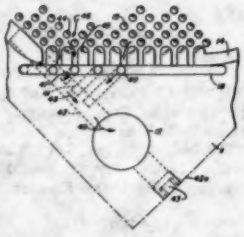
MEMBRANE FILTER PLATE

Steven S. Davis, Bountiful, Utah, assignor to Baker Hughes Incorporated, Houston, Tex.

Division of Ser. No. 307,436, Feb. 6, 1989, Pat. No. 4,911,839. This application Mar. 2, 1990, Ser. No. 487,675

Int. Cl.[5] B01D *25/12*

U.S. Cl. 210—231 **4 Claims**



1. In combination, a filter plate having a recessed filtering zone, a peripheral sealing zone surrounding the filter zone and a transition zone peripherally extending between said filtering and peripheral zones;

means for providing an alternative to a ported membrane, including at least one essentially planar flexible elongatable imperforate membrane having an outer periphery anchored adjacent to said peripheral zone and pip means on said membrane for supporting a filter media, said membrane extending across said filtering and transition zones;

wherein said filter plate contains at least one open collection groove in a face surface of said plate adjacent to one or more edges of said filter plate, a through-plate outlet port and passage means in said plate interconnecting said collection groove to said outlet port; and

wherein an outer edge of said membrane is positioned juxtaposed to said collection groove and filtrate from a slurry being filtered is passed through said filter media, passes around said pip means and exits at said membrane outer edge into said connection groove for disposal through said outlet port.

4,964,987

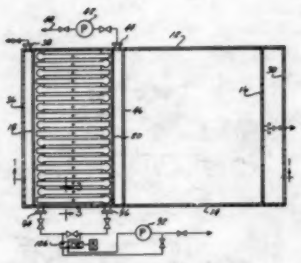
CROSS FLOW FILTER APPARATUS

Willard L. Johnson, 12923 W. Lincoln Ave., Huntington Woods, Mich. 48070

Continuation-in-part of Ser. No. 120,581, Nov. 19, 1987, Pat. No. 7,859,332, which is a continuation-in-part of Ser. No. 24,383, Mar. 19, 1987, abandoned, and a continuation-in-part of Ser. No. 932,010, Nov. 26, 1986, Pat. No. 4,790,935. This application Jun. 10, 1988, Ser. No. 205,456

Int. Cl.[5] B01D *29/62*

U.S. Cl. 210—332 **14 Claims**



1. A cross flow filter apparatus comprising:

an open tank having a first contaminated liquid retaining section, a second filter retaining section and a third solids collection section in fluid communication with each other;

a filtering assembly retained within the second section, the filtering assembly including a filter panel having a generally vertically disposed filter media surface with pores;

a filtrate removal pump having a suction inlet in fluid communication with the filter panel for applying vacuum pressure in communication with the filter panel such that filtrate is drawn through the pores of the filter media surface at a flow rate Q_{out}; and

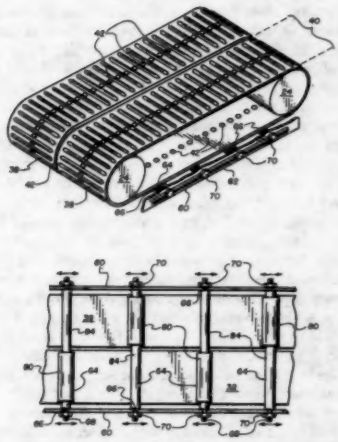
a cross flow pump having a suction inlet in fluid communication with the first contaminated liquid retaining section of the open tank for drawing contaminated liquid from the first section and further having a pressurized discharge outlet in fluid communication with the second filter retaining section of the open tank for discharge pressurized contaminated liquid at a flow rate Q_x vertically downward across the filter media surface, such that the horizontal velocity V_h of liquid drawn through the filter media surface is less than the vertical velocity V_v of the cross flowing contaminated liquid, wherein the vertical velocity V_v flushingly shears particles from the filter media surface while said filtrate removal means operates.

4,964,988

HORIZONTAL BELT FILTER GUIDE

Max A. Mueller, Centerville, Utah, assignor to Baker Hughes, Incorporated, Houston, Tex.

Filed Jun. 30, 1988, Ser. No. 213,360
Int. Cl.[5] B01D *33/056*
U.S. Cl. 210—401 13 Claims



8. A horizontal filter comprising:

a pair of endless belts trained about a pair of drums mounted on a frame, at least one of said drums being driven, said belts providing an upper working run and a lower return run;

a first guide support mounted on said frame, said guide having a first roller engaging a first belt on a lower surface of its lower return run, said first roller being rotatable about a first horizontal axis, said first horizontal axis being oriented transverse to a direction of travel of said first belt means for adjusting the orientation of said first roller on said frame such that said first horizontal axis is angularly displaceable about a first vertical axis and within a horizontal plane to impart a preselectively directioned force to said first belt to adjust a tracking of said first belt on said drums; and

a second guide support mounted on said frame, said guide support having a second roller engaging a second belt, said second roller being rotatable about a second horizontal axis, said second horizontal axis being oriented transverse to a direction of travel of said second belt, means for adjusting the orientation of said second roller on said frame such that said second horizontal axis is angularly displaceable about a second vertical axis and within a horizontal plane to impart a preselectively directioned force to said second belt to adjust a tracking of said second belt on said drums.

4,964,989

MEMBRANES WITH LOW PROTEIN ADSORBABILITY

Thomas C. Gsell, Glen Cove, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Dec. 23, 1986, Ser. No. 945,867
Int. Cl.[5] B01D *69/02*
U.S. Cl. 210—490 18 Claims

1. A porous polymeric medium having low affinity for amide group-containing materials comprising:

a liquophilic porous polymeric substrate; and

a polymer coating having a low affinity for amide group-containing materials formed in situ at the surface of said porous polymeric substrate, the polymer coating derived from a polymer having a plurality of hydroxyl groups and a cross-linking agent having functional groups which react with the hydroxyl groups.

4,964,990

FILTRATION MEMBRANES AND METHOD OF MAKING THE SAME

Menahem Kraus, Ann Arbor; Mark Heisler, Saline; Inessa Katsnelson, Ann Arbor, and Diosie Velazques, Saline, all of Mich., assignors to Gelman Sciences, Inc., Ann Arbor, Mich.

Continuation of Ser. No. 52,699, May 20, 1987, Pat. No. 4,900,449. This application Jan. 10, 1990, Ser. No. 463,250
Int. Cl.[5] B01D *69/02*
U.S. Cl. 210—490 13 Claims

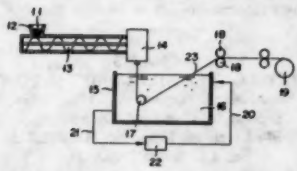
1. A microporous membrane comprising a polymer which in bulk form is hydrophobic and has an equilibrium water absorption ranging from about 2% to about 4% and which is blended with a polymer additive in an amount effective to make the membrane when formed and dried inherently water wettable with a pore size range such that the membrane does not retain or reject dissolved proteins or salts from aqueous feed solutions, the thus dried membrane being post treated with aqueous polyvinyl alcohol and subsequently crosslinked such that the post treated membrane retains wettability after prolonged extraction in isopropanol or extended heat treatment.

4,964,991

FLAT PERMEABLE MEMBRANE AND FOR MANUFACTURE THEREOF

Yukio Seita, Fuji, and Makoto Emi, Fujinomiya, both of Japan, assignors to Terumo Corporation, Tokyo, Japan

Continuation of Ser. No. 796,434, Nov. 8, 1985, abandoned. This application Aug. 12, 1987, Ser. No. 85,317
Claims priority, application Japan, Nov. 9, 1984, 69-236179
Int. Cl.[5] B01D *71/26*
U.S. Cl. 210—500.36 18 Claims



1. A method for manufacturing a flat permeable membrane, which method comprises:

mixing a molten polyolefin, a crystal seed forming agent, and an organic filler uniformly dispersible in said molten polyolefin and easily soluble in an extractant to be used,

discharging the resultant mixture in a molten state through a die to obtain a molten membrane,

cooling and solidifying the discharged molten membrane by contacting said molten membrane with a cooling fluid, and

removing said organic filler by contacting the cooled and solidified membrane with an extactant capable of dissolving the organic filler but incapable of dissolving said polyolefin and said crystal forming agent.

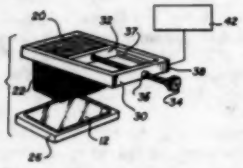
18. A flat permeable membrane produced in accordance with the process of claim 1 for removing pathogenic macromolecules from blood plasma compositions.

4,964,992

METHOD OF MAKING MEMBRANE-TYPE FILTER AND PRODUCT THEREOF

Susan H. Goldsmith, 5941 Daly Rd., Dexter, Mich. 48130, and George P. Grundelman, 2030 Wolf Lake Rd., Grass Lake, Mich. 49240

Filed Mar. 21, 1989, Ser. No. 326,773
Int. Cl.[5] B01D *69/06*
U.S. Cl. 210—500.36 **17 Claims**



16. A membrane filter for use in separating extremely small particles, said filter formed by the process of piercing tapered pores into a membrane with a plurality of piercing means comprising:

a membrane having a plurality of pores therein with each of said pores having a predetermined controlled shape and dimension between the entry and exit sides of said membrane and a substantially tapered cross-sectional configuration so that the cross-sectional area of said pores at said entry side is greater than the cross-sectional area of said pores at said exit side;

said pores being spaced from one another at predetermined locations;

whereby said membrane material has a predetermined controlled porosity and flow rate and whereby said tapered pores act as pre-screens at said entry side and final screens at said exit side; and

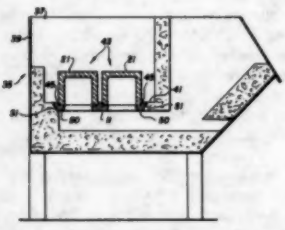
said tapered pores being formed by a plurality of tapered piercing means perforating a membrane material, said tapered piercing means being bundled together to control the spacing between said tapered pores and controlling the depth of penetration of said tapered piercing means such that the cross-sectional area of said pore at said exit and entry side may be controlled.

4,964,993

MULTIPLE-USE MOLTEN METAL FILTERS

Edwin P. Stankiewicz, Warrensville Hts., Ohio, assignor to Stemcor Corporation, Cleveland, Ohio

Filed Oct. 16, 1984, Ser. No. 661,543
Int. Cl.[5] B01D *29/35, 29/36*
U.S. Cl. 210—510.1 **59 Claims**



1. A filter medium, containing at least one porous ceramic portion, substantially all of said at least one porous ceramic portion of which is capable of functioning to filter molten metal which is flowed therethrough, forming a flow path, comprising:

(a) a sealing plate means of heat resistant material including an upper and lower surface when positioned substantially horizontally and at least one cross-sectional thickness;

(b) at least one hollow cylindrical element means of porous ceramic material, containing at least one wall which includes at least one cross-sectional thickness and at least one end, mountable to and projecting perpendicularly from said upper surface of, and structurally supported by, said sealing plate means, said at least one cross-sectional thickness of said at least one wall of said at least one cylindrical element means being generally equivalent to said at least one cross-sectional thickness of said sealing plate means, said sealing plate means which forms a junction with each of said at least one hollow cylindrical element means such that a surface of said sealing plate means is positioned adjacent to at least one exterior surface of said at least one hollow cylindrical element means, said at least one hollow cylindrical element means of porous ceramic material which functions to shed, and cause to fall of said at least one exterior surface thereof, filter cake impurities, and inclusions trapped adjacent thereto from within said hollow cylindrical element means, said shedding and falling off which functions to enhance depth filtration of said hollow cylindrical element means, said functions of shedding and falling off and said function of said enhancing depth filtration both of which function to render said filter medium reusable, wherein said sealing plate and said at least one hollow cylindrical element are physically separate items and are fitted together with gasket means interposed therebetween;

(c) at least one cap element means of porous ceramic material, each containing at least one cross-sectional thickness in the form of a solid cylindrical section, mounted to said at least one end of each said at least one cylindrical element means which is remote from each of said junctions of each of said at least one cylindrical element means and said sealing plate, so as to close-off each of said at least one ends of said at least one cylindrical element means, said at least one cap element means which is generally equivalent in cross-sectional thickness to said cross-sectional thickness of said sealing plate means;

(d) port means associated with said sealing plate means which functions to provide extensions of the interior of each of said at least one hollow cylindrical element means through said sealing plate means; and

(e) means for suspending said sealing plate means substantially horizontally in said flow path of molten metal which functions to cause said molten metal to flow from the exterior surfaces of each of said at least one cylindrical element means, each of said cap element means and the surface of said sealing plate means, adjacent to each of said exterior surfaces, through said sealing plate, said cylindrical element means and said cap element means and which functions to dispose said sealing plate means such that said sealing plate means functions to accumulate said impurities and said inclusions which have been shed and fallen off of said hollow cylindrical element means.

4,964,994

HYDROCYCLONE SEPARATOR

William D. Wakley, Broken Arrow; J. Robert Worrell, and Grant A. Young, both of Tulsa, all of Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Mar. 21, 1989, Ser. No. 326,719
Int. Cl.[5] B04C *3/00*
U.S. Cl. 210—512.1 **8 Claims**

1. A hydrocyclone separator consisting essentially of:

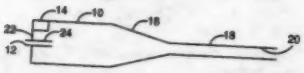
a substantially cylindrical first portion having a central overflow outlet at a first end and having at least one tangential flow inlet adjacent the first end, and directly connected at a second end to a conical second portion;

the conical second portion having essentially a single cone angle and directly connected at an end opposite the cylindrical first portion to a cylindrical third portion;

the cylindrical third portion having a central overflow outlet at an end opposite the conical second portion;

the internal diameter of the cylindrical first portion being Dc; the diameter of a circle having the same area as the least one tangential flow inlet, regardless of shape, being di; the internal diameter of the central overflow outlet being do, the internal length of the cylindrical first portion being Lc, the cone angle of the conical second portion being α, the internal length of the cylindrical third portion being Ls, and the internal diameter of the underflow outlet being du; and

the configuration of the hydrocyclone separator being in accordance with the following relationships:



$do < du < Dc$

$0.1 < di/Dc \times 0.04$

$0.01 \leq do/Dc \leq 0.06$

$0 \leq Lc/Dc \approx 2.0$

$3° \leq \alpha \leq 30°$

$0.1 \leq du/Dc \leq 0.5$

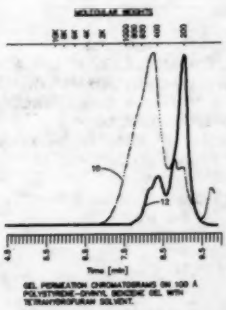
$9 \leq Ls/Dc.$

4,964,995

SUPERCRITICAL SEPARATION PROCESS FOR COMPLEX ORGANIC MIXTURES

Helena L. Chum, Arvada, Colo., and Giuseppe Filardo, Palermo, Italy, assignors to Midwest Research Institute, Kansas City, Mo.

Filed Jun. 16, 1989, Ser. No. 368,170
Int. Cl.[5] B01D *11/00*
U.S. Cl. 210—634 **34 Claims**



GEL PERMEATION CHROMATOGRAMS ON 100 Å POLYSTYRENE–DIVINYL BENZENE GEL WITH TETRAHYDROFURAN SOLVENT.

27. A process for separating preselected low molecular weight lignin fragments, having a molecular weight in the range of 150 to 400, from soluble lignin-containing mixtures and complex polyhydroxycarboxylic acid comprising:

preparing a solution of supercritical carbon dioxide and an effective amount of a low boiling point organic entrainer selected from the group consisting of methanol, ethanol, acetone, methylethylketone, tetrahydrofuran and methyl-t-butyl ether at a temperature of about 70°–150° C. and at a pressure of about 1500–4000 psi to maintain the carbon dioxide solution at or above its supercritical level and selectively extract the desired fragments;

contacting the carbon dioxide/entrainer solution with the lignin-containing mixture until the solution and mixture are in equilibrium to extract the preselected low molecular weight fragments from the mixture; and

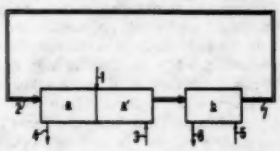
isolating the entrainer/extracted fragments from the solution, by reducing the pressure, lowering the temperature, or a combination of reducing the pressure and lowering the temperature.

4,964,996

LIQUID/LIQUID EXTRACTION OF RARE EARTH/COBALT VALUES

Alain Leveque, La Rochelle, and Richard Fitoussi, Saint-Mande, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Feb. 21, 1989, Ser. No. 312,486
Claims priority, application France, Feb. 19, 1988, 88 01980
Int. Cl.[5] B01D *11/04*
U.S. Cl. 210—634 **22 Claims**



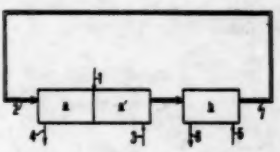
1. A process for the separation and recovery of rare earth and cobalt values from a residue material containing same, which comprises (a) dissolving such residue with nitric acid, (b) liquid/liquid extracting the resulting aqueous nitric phase with an organic phase comprising at least one water-insoluble organic extractant having at least one primary, secondary, tertiary or quaternary amine function, whereby the rare earth values are transferred into said organic phase, and (c) recovering said rare earth values from the organic phase.

4,964,997

LIQUID/LIQUID EXTRACTION OF RARE EARTH/COBALT VALUES

Alain Leveque, La Rochelle; Richard Fitoussi, Saint-Mande, and Jean-Louis Sabot, Maisons Laffitte, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Feb. 21, 1989, Ser. No. 312,485
Claims priority, application France, Feb. 19, 1988, 88 01981
Int. Cl.[5] B01D *11/04*
U.S. Cl. 210—634 **22 Claims**



1. A process for the separation and recovery of rare earth and cobalt values from a residue material containing same, which comprises (a) dissolving such residue with nitric acid, (b) liquid/liquid extracting the resulting aqueous nitric phase

with an organic phase comprising at least one water-insoluble neutral organophosphoric extractant, whereby the rare earth values are transferred into said organic phase, and (c) recovering said rare earth values from the organic phase.

4,964,998

USE OF TREATED COMPOSITE POLYAMIDE MEMBRANES TO SEPARATE CONCENTRATED SOLUTE

John E. Cadotte, Minnetonka; Joel-Raphael Racchini, St. Louis Park, and Robert J. Petersen, Minneapolis, all of Minn., assignors to FilmTec Corporation, Minneapolis, Minn.

Filed Dec. 13, 1989, Ser. No. 450,706
Int. Cl.[5] B01D *61/02*
U.S. Cl. 210—654 **18 Claims**

1. A reverse osmosis membrane process for separating water from an aqueous solution containing at least one selected solute which has a solute passage through a composite crosslinked polyamide membrane at least twice that of sodium chloride at like conditions comprising: (A) contacting a first side of a treated composite crosslinked polyamide membrane with an aqueous feed solution containing said selected solute at conditions where a chemical potential exists between the first side and a second side of the membrane sufficient that water having a reduced concentration of the selected solute relative to the aqueous feed solution diffuses through the membrane from the first side to the second side: and (B) collecting the purified water from the second side of the membrane, by providing the treated composite, crosslinked polyamide membrane with properties of substantial tolerance to acidic or basic conditions and organic materials, while maintaining high water flux, by a process comprising contacting: (i) a crosslinked polyamide discriminating layer, which is derived from reactants comprising (a) a compound or polymer bearing at least two aromatic primary amine groups and (b) a compound or polymer bearing an average of more than two carboxylic acid halide groups, said reactants being interfacially polymerized on a microporous support, with (ii) an effective amount of an amine-reactive reagent or compatible oxidant, sufficient that the membrane after treatment has a water flux of at least 50 percent of the membrane prior to treatment and passage of the selected solute in an aqueous solution at the same selected solute concentration in the feed and an equivalent operating pressure at 25° C. is reduced by at least 30 percent relative to that obtained with the same membrane prior to treatment.

4,964,999

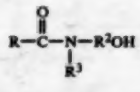
PROCESS FOR FORMING STABLE EMULSIONS OF WATER SOLUBLE POLYSACCHARIDES IN HYDROCARBON LIQUIDS

Donald P. Russo, Louisville, Ky., assignor to Hi-Tek Polymers, Inc., Jeffersontown, Ky.

Continuation-in-part of Ser. No. 61,822, Jun. 15, 1987, abandoned. This application Nov. 7, 1988, Ser. No. 268,251
Int. Cl.[5] E21B *43/00*; C09K *3/00*
U.S. Cl. 252—8.551 **14 Claims**

1. A process for forming a stable emulsion of a water soluble polysaccharide in a hydrocarbon liquid which comprises:

(a) blending a finely divided water soluble polysaccharide with a surfactant which is a fatty acid alkanol amide having the formula:



wherein R is an alkyl group having about 12 to about 30 carbon atoms, R^2 is an alkylene group having 2 to about 4 carbon atoms and R^3 is H or R^2OH in the amount of about 0.5 to about 5 weight percent surfactant based on the weight of the polysaccharide to form a dry powder;

(b) dispersing (a) in a hydrocarbon liquid; and

(c) adding water to the dispersion of (b) to form a stable emulsion wherein the polysaccharide is present in the amount of about 25 to about 40 weight percent, the water is present in the amount of about 15 to about 30 weight percent and the hydrocarbon liquid is present in the amount of about 30 to about 60 weight percent, said weight percents being based on the total weight of the emulsion.

4,965,000

FABRIC SOFTENER COMPOSITION AND LAUNDRY CLEANING ARTICLE CONTAINING SAME

David C. Potts, Marietta, Ga.; Maung H. Win, Neenah, and Lee P. Garvey, Little Chute, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jul. 5, 1989, Ser. No. 376,064
Int. Cl.[5] D06M *15/00*
U.S. Cl. 252—8.75 **29 Claims**

1. A fabric softener composition comprising a mixture of a fabric softener, polystyrene, a plasticizer and a long chain branched primary alcohol having a chain length of 8 carbon atoms or more, said fabric softener composition being effective to reduce static electricity while drying a load of laundry in a clothes dryer.

4,965,001

LUBRICATION BLENDS

James P. King, Lansdale, Pa., assignor to Atochem North America, Inc., Philadelphia, Pa.

Filed May 2, 1989, Ser. No. 346,102
Int. Cl.[5] C10M *125/10, 125/22*
U.S. Cl. 252—30 **27 Claims**

1. A lubrication blend, having improved performance characteristics, consisting essentially of:

(a) at least one complex sulfide of antimony, represented by the formula:

$$Sb_xS_y$$

wherein, x is a number in the range from about 1.7 to about 2.3, and y is a number in the range from about 3.6 to about 4.4,

(b) at least one antimony oxide, and

(c) at least one lamellar crystalline solid lubricant.

4,965,002

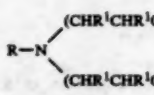
PHOSPHITE AMINE LUBRICANT ADDITIVES

William T. Brannen, Westlake; Gerald D. Burt, Moreland Hills, and Randolph A. McDonald, Berea, all of Ohio, assignors to Elco Corporation, Cleveland, Ohio

Filed Jan. 27, 1988, Ser. No. 148,828
Int. Cl.[5] C10M *105/74*
U.S. Cl. 252—32.5 **20 Claims**

1. A lubricant additive comprising the reaction product of

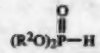
(a) an alkoxylated amine of the formula



(I)

wherein R is a C_6 to C_{30} hydrocarbon group, each R^1 is individually hydrogen or a C_1 to C_6 hydrocarbon group, and x and y are integers from 0 to 10, at least one of which is not 0, with

(b) a phosphite of the formula

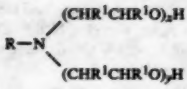


(II)

wherein R^2 is a C_8 to C_{30} hydrocarbon group.

13. A lubricant composition comprising a major proportion of a lubricating oil and a friction reducing amount of a lubricant additive comprising the reaction product of

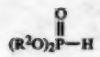
(a) an alkoxylated amine of the formula



(I)

wherein R is a C_6 to C_{30} hydrocarbon group, each R^1 is individually hydrogen or a C_1 to C_6 hydrocarbon group, and x and y are integers of from 0 to 10, at least one of which is not 0, with

(b) a phosphite of the formula



(II)

wherein R^2 is a C_8 to C_{30} hydrocarbon group.

4,965,003

BORATED DETERGENT ADDITIVE BY AN IMPROVED PROCESS

Raymond C. Schlicht, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Apr. 21, 1989, Ser. No. 342,137

The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.

Int. Cl.[5] C10M *105/72*

U.S. Cl. 252—38 **42 Claims**

1. A process for preparing a borated, overbased oil-soluble metal detergent additive for lubricants, said process comprising:

(a) mixing a metal salt dissolved in a hydrocarbon solvent with a metal base and a polar solvent;

(b) treating said metal salt mixture at a temperature ranging from about 10° to about 100° C. while passing an acid gas through the mixture;

(c) filtering said treated mixture at a temperature of about 10° to about 100° C.;

(d) adding a borating agent to said filtrate and reacting said filtrate for a period of about 0.25 to about 5.0 hours at a temperature ranging from about 15° to about 100° C.;

(e) heating said borated mixture at a temperature sufficiently high to distill a major portion of the polar solvent and water therefrom;

(f) cooling the distilled borated mixture to below the boiling point of the remaining solvent and filtering said cooled filtrate mixture; and

(g) stripping the cooled distilled filtrate mixture under a pressure ranging from about 10 to about 200 mm Hg. at a temperature ranging from about 20° to about 150° C., thereby recovering the borated metal detergent additive.

21. A process for preparing a borated, overbased oil-soluble metal detergent additive for lubricants, said process comprising:

(a) mixing a metal salt dissolved in a hydrocarbon solvent with a metal base and a polar solvent;

(b) treating said metal salt mixture at a temperature ranging from about 10° to about 100° C. by passing an acid gas through the mixture;

(c) adding a borating agent to said treated mixture and reacting said mixture for a period of about 0.25 to about 5.0 hours at a temperature ranging from about 15° to about 100° C.;

(d) heating said borated mixture at a temperature sufficiently high to distill a major portion of the polar solvent and water therefrom;

(e) cooling the distilled borated mixture to below the boiling point of the remaining solvent and filtering said cooled filtrate mixture; and

(f) stripping the cooled distilled filtrate mixture under a pressure ranging from about 10 to about 200 mm Hg. at a temperature ranging from about 20° to about 150° C., thereby recovering the borated metal detergent additive.

4,965,004

PROCESS FOR A BORATED DETERGENT ADDITIVE

Raymond C. Schlicht, Fishkill, N.Y., and William J. Powers, III, Port Arthur, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 21, 1989, Ser. No. 342,136

The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.

Int. Cl.[5] C10M *135/10*

U.S. Cl. 252—38 **10 Claims**

1. A process for preparing a borated, overbased oil-soluble metal detergent additive for lubricants, said process comprising:

(a) adding a borating agent to an overbased metal salt in the presence of a protic solvent and a hydrocarbon solvent and reacting for a period of 0.25 to about 5.0 hours at a temperature ranging from about 15° C. to about 100° C.;

(b) heating said borated metal salt mixture at a temperature sufficiently high to distill an amount of distillate equal to at least about 80 percent of the protic solvent fed;

(c) cooling the distilled borated mixture to below the boiling point of the remaining solvent and filtering said cooled distilled mixture; and

(d) stripping the cooled distilled filtrate mixture under a reduced pressure ranging from about 10 to about 200 mm Hg. at a temperature ranging from about 20° to about 150° C., and recovering the borated metal detergent additive.

4,965,005

AMINOMETHYL DERIVATIVES OF MONOTHIOCARBAMATES AND DITHIOCARBAMATES AS ADDITIVES FOR LUBRICANTS

Hugo Camenzind, Fribourg, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

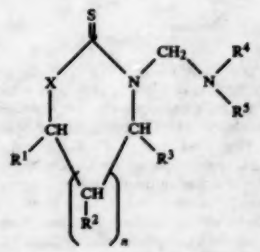
Filed Sep. 12, 1988, Ser. No. 242,832

Claims priority, application Switzerland, Sep. 17, 1987, 3589/87

Int. Cl.[5] C10M *135/18, 135/14*

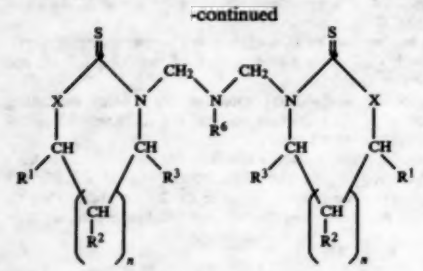
U.S. Cl. 252—47 **21 Claims**

1. A composition containing one or more lubricants or hydraulic oils based on mineral oil, synthetic oils or mixtures thereof and at least one compound of the formulae I, II and/or III,

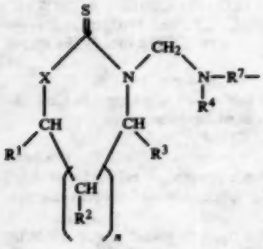


I

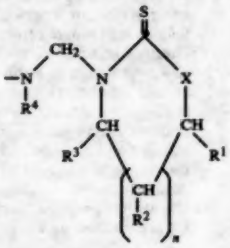
-continued



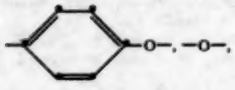
II



III

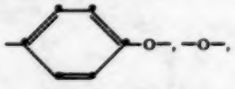


in which R^1, R^2, R^3, R^4, R^5 and R^6 independently of one another are C_1–C_{24}alkyl or C_1–C_{24}alkyl which is substituted by oxo or thiono groups or C_3–C_{24}alkyl which is interrupted by



—O—, —O—,

—S— and/or —N(R^8)— in which R^8 is hydrogen or C_1–C_1-2alkyl, or C_3–C_{24}-alkyl which is interrupted by



—O—, —O—,

—S— and/or —N(R^8)— in

which R^8 is hydrogen or C_1–C_{12}alkyl, and which is substituted by oxo or thiono groups, or C_2–C_{24}alkenyl, or phenyl or naphthyl which is unsubstituted or is substituted by one or two C_1–C_{12}alkyl, C_1–C_4alkoxy, C_2–C_{24}carboalkoxy or nitro groups, or are C_7–C_{10}phenylalkyl, and R^1, R^2, R^3 and R^4 additionally are hydrogen, or R^1 and R^2, or R^1 and R^3 in the event that n is zero, together with the C atoms to which they are attached, form a 5-membered or 6-membered aliphatic ring or form a 5-membered or 6-membered aliphatic ring which is substituted by oxo or thiono groups, or form a 5-membered or 6-membered aliphatic ring which is interrupted by —N(R^8)— in which R^8 is as defined above, —O— or —S—, or form a 5-membered or 6-membered aliphatic ring which is interrupted by —N(R^8)— in which R^8 is as defined above, —O— or —S— and is substituted by oxo or thiono groups, or in which R^4 and R^5, together with the N atom to which they are attached, form a 5-membered to 7-membered aliphatic-heterocyclic ring, or in which R^4 and R^5, together with the N atom to which they are attached, form a 5-membered to 7-membered aliphatic-heterocyclic ring and the ring is substituted by oxo or thiono groups and/or contains, additionally to the N atom, therefor N(R^8), O or S and in which R^7 is C_2–C_{12}alkylene, C_2–C_{12}alkylene which is interrupted by —N(R^8)—, —O— and/or —S—, C_2–C_1-2alkylene which contains oxo or thiono groups or C_2–C_1-2alkylene which is interrupted by —N(R^8)—, —O— and/or —S— and contains oxo or thiono groups, C_6–C_{15}cycloalkylene, C_6–C_{15}arylene, carbonyl or thiocarbonyl, or the group —N(R^4)—R^7—N(R^4)— is a piperazine-1,4-diyl radical or a piperazine-1,4-diyl radical which is substituted by one or more methyl groups, and X is oxygen or sulfur and n is the numbers zero or 1.

4,965,006

N-SUBSTITUTED TETRAHYDROQUINOLINES FOR USE AS ANTIOXIDANTS IN LUBRICANTS

Hans R. Meier, and Samuel Evans, both of Marly, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 135,964, Dec. 21, 1987, Pat. No. 4,828,741. This application Feb. 2, 1989, Ser. No. 305,036

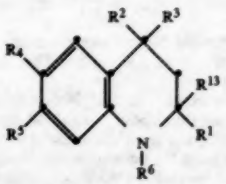
Claims priority, application Switzerland, Dec. 30, 1986, 5253/86

Int. Cl.[5] C10M *105/56*

U.S. Cl. 252—50 **12 Claims**

1. A process for stabilizing a lubricant, hydraulic oil or metal-working fluid against oxidative degradation which comprises

incorporating into said lubricant, hydraulic oil or metal-working fluid 0.05–5% by weight, based on the total weight of lubricant, hydraulic oil or metal-working fluid composition, of at least one compound of formula I

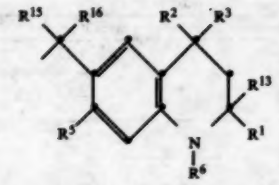


(I)

in which R^1 and R^2 are independently of each other C_1–C_8alkyl, unsubstituted or C_1–C_{12}-alkyl-, Cl-, Br-, NO_2-, OH- or C_1–C_{12}-alkoxy substituted phenyl or naphthyl, or benzyl,

R^3 is hydrogen or methyl,

R^4 and R^5 are independently of each other hydrogen, methyl, methoxy, -Cl or -NO_2, and R^4 additionally in formula I is a radical of formula III



(III)

in which R^{15} and R^{16} are independently of each other hydrogen, C_1–C_9-alkyl, unsubstituted or C_1–C_{12} alkyl-substituted phenyl, or benzyl, α-methylbenzyl, α,α-dimethylbenzyl, or R^{15} and R^{16} are, together with the C atom to which they are bonded, a 5-, 6- or 7-membered ring, with the proviso that when R^4 is a radical of formula III, R^5 is hydrogen, and in which furthermore R^6 is C_1–C_{18}-alkyl, C_3–C_{18}-alkenyl, C_7–C_{12}-aralkyl, C_7–C_{12}alkaryl or C_1–C_{12}-alkyl, Cl-, Br-, Br-, I-, NO_2-, OH- or C_1–C_{12}-alkoxy-ring substituted benzyl, and

R^{13} is hydrogen or methyl.

4,965,007

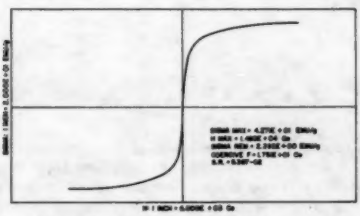
ENCAPSULATED SUPERPARAMAGNETIC PARTICLES

Joseph S. Yudelson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 10, 1988, Ser. No. 192,753

Int. Cl.[5] H01F 1/26; B01J 13/10

U.S. Cl. 252—62.53 **33 Claims**



1. Encapsulated superparamagnetic particles having a narrow particle size distribution, the mean diameter of the particles being within the range of from about 70 Å to about 450 Å, said particles comprising particles of magnetite having a narrow particle size distribution, the mean diameter of the magnetite particles being between about 50 Å and about 350 Å, said magnetite particles having a magnetization of greater than about 30 emu/gm and a coercive force of less than about 30 Oe, said magnetite particles being encapsulated with a coating of a crosslinked coacervate of gelatin and a polymeric acid and wherein the weight ratio of magnetite to coacervate in said encapsulated particles on a dry basis is from 4:1 to 1:1.

4,965,008

BAR OF SOAP HAVING A RECESSED PORTION FOR RECEIVING ANOTHER, USED, PIECE OF SOAP

Chun-Hsiung Chang, No. 441, Hwa-Shiun IV Tsuen, Chung-Li City, Taiwan

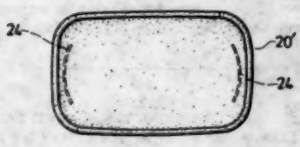
Filed Oct. 13, 1989, Ser. No. 421,131

Claims priority, application Taiwan, Jun. 23, 1989, 78205965

Int. Cl.[5] C11D 17/00

U.S. Cl. 252—134 **4 Claims**

1. A bar of soap having a recessed portion for receiving another used piece of soap which is to be adhered thereto, said bar of soap having a marked portion formed therein which only becomes exposed when said bar of soap has been worn to a predetermined size adapted to be inserted into the recessed portion of another unused bar of soap having a recessed portion as described above.



2. A bar of soap as claimed in claim 1, wherein said marked portion is formed by soap which is of a color different than the remaining portion of said bar of soap.

4,965,009

AQUEOUS ACIDIC CLEANER FORMULATIONS

Richard Baur, Mutterstadt; Dieter Stoeckigt, Ludwigshafen; Hans-Werner Neumann, Reilingen; Hans-Helmut Goertz, Freinsheim, and Norbert Wagner, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 27, 1989, Ser. No. 343,664

Claims priority, application Fed. Rep. of Germany, May 5, 1988, 3815291

Int. Cl.[5] C11D 7/08; C23G 1/02; C09K 13/04; B08B 3/00

U.S. Cl. 252—142 **11 Claims**

1. An aqueous acidic cleaner formulation comprising:

(a) 1–20 wt. % of one or more nonionic surfactants based on adducts of from 3–11 moles of ethylene oxide with one mole of a fatty alcohol, fatty acid, fatty amine, fatty amide or alkanesulfonamide,

(b) 0.1–15 wt. % of one or more polyether polyols which are obtained by reacting a dihydric to hexahydric alcohol of 2–10 carbon atoms with an alkylene oxide of 2–4 carbon atoms and reacting the product of this reaction with a $C_{8\text{-}30}$ 1,2-alkylene oxide, $C_{8\text{-}30}$ alkyl glycidyl ether or $C_{8\text{-}30}$ alkynyl glycidyl ether, and

(c) 1–40 wt. % of one or more acids, the percentages in each case being based on the weight of the total formulation.

4,965,010

PAINT STRIPPING COMPOSITION CONTAINING KETONES, METHANOL, AND AROMATIC HYDROCARBON

Ralph R. Swett, 701 Putnam, Wakefield, Mich. 49968

Filed Oct. 27, 1988, Ser. No. 263,426

Int. Cl.[5] C09D 9/00; B01F 1/00

U.S. Cl. 252—170 **8 Claims**

1. A stripping composition characterized by an absence of chlorinated hydrocarbons and comprising:

22 to 33 percent by weight methylethyl ketone;

20 to 30 percent by weight methanol;

20 to 30 percent by weight of one or more of the following: acetone, xylene and toluene; and

20 to 30 percent by weight acetone.

4,965,011

AZEOTROPE-LIKE COMPOSITIONS OF 1,1-DICHLORO-1-FLUOROETHANE, DICHLOROTRIFLUOROETHANE, AND NITROMETHANE

Ellen L. Swan, Ransomville; Rajat S. Basu, Williamsville, both of N.Y., and Joel E. Rodgers, Convent Station, N.J., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Oct. 4, 1989, Ser. No. 417,134

Int. Cl.[5] C11D 7/30, 7/50

U.S. Cl. 252—171 **20 Claims**

1. Azeotrope-like compositions consisting essentially of from about 25 to about 99.5 weight percent 1,1-dichloro-1-fluoroe-

thane, from about 0.5 to about 74.5 weight percent 1,1-dichloro-2,2,2-trifluoroethane, and from about 0.01 to about 0.5 weight percent nitromethane wherein said azeotrope-like components consist of said 1,1-dichloro-1-fluoroethane, said 1,1-dichloro-2,2,2-trifluoroethane, and said nitromethane and said azeotrope-like compositions boil at about 31.8° C. at 760 mm Hg.

4,965,012

WATER INSOLUBLE ENCAPSULATED ENZYMES PROTECTED AGAINST DEACTIVATION BY HALOGEN BLEACHES

Keith E. Olson, 13952 Eveleth Court, Apple Valley, Minn. 55124

Continuation of Ser. No. 40,191, Apr. 17, 1987, abandoned. This application Feb. 27, 1989, Ser. No. 316,599

Int. Cl.[5] C11D *3/38, 7/42;* C12N *11/14;* D06L *3/16*

U.S. Cl. 252—174.12 **22 Claims**

1. An encapsulating enzyme composition capable of delivering active enzyme into a solution containing an active chlorine which comprises:

(a) an enzyme core comprising a protease, a lipase, an amylase, or mixtures thereof;

(b) a first encapsulating coating of a chlorine bleach-neutralizing substance comprising a sulf-oxy acid or salt thereof, a peroxide producing substance or a sugar; and

(c) a second encapsulating coating of a time-release substance comprising a cellulose derivative.

4,965,013

METHOD OF HIGH TEMPERATURE LAUNDERING USING SODIUM CITRATE AND AN ANIONIC

Karen L. Pratt, Elkhart, Ind., assignor to Miles Inc., Elkhart, Ind.

Filed May 1, 1989, Ser. No. 345,972

Int. Cl.[5] C11D *3/22, 1/02, 7/10;* D06L *1/12*

U.S. Cl. 252—174.19 **5 Claims**

1. A method of cleaning soiled fabric which involves contacting it with an aqueous composition consisting essentially of hard water, from about 10 to 30% of an anionic detergent, 0 to 20% of a non-ionic detergent and 2 to 18% sodium citrate as the sole detergent builder at a temperature in the range of from about 70° C. to the boiling temperature of the composition.

4,965,014

LIQUID NONIONIC SURFACTANT MIXTURES

Peter Jeschke, Neuss; Eva Kiewert, Duesseldorf; Claus Nieendick, Krefeld; Hans Nuessleln, Langenfeld, and Peter Sandkuehler, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 137,117, Dec. 22, 1987, abandoned. This application Jun. 1, 1989, Ser. No. 361,672

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643895

Int. Cl.[5] C11D *3/04, 7/00, 3/066, 1/83*

U.S. Cl. 252—174.22 **20 Claims**

1. A liquid nonionic surfactant mixture comprising linear alcohols and/or ether alcohols methyl-branched in the 2 position, of the formula

$$R—O—(PO)_{1-2}—(EO)_{6-8}—H$$

wherein:

PO is the residue of a ring-opened propylene oxide;

EO is the residue of a ring-opened ethylene oxide; and

R is a mixture of alkyl or alkenyl moities of about the following distribution:

Carbon atoms	weight percent
C_8	0-5
C_{9-10}	75-90
C_{11-12}	5-15
C_{13-14}	4-10
C_{15-16}	0-3
Total	100%

4,965,015

DETERGENT COMPOSITION AND PROCESS FOR ITS PRODUCTION

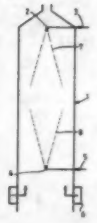
Michael J. H. Heybourne, Hertfordshire; Peter C. Knight, South Wirral, both of England; Antonio Malguzzin, Milan; Daniele Miotti, Piacenza, both of Italy, and Andrew W. Travill, deceased, late of Wirral, England (by Travill Rachel May, legal representative), assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 97,007, Sep. 14, 1987, abandoned. This application Oct. 17, 1989, Ser. No. 425,495

Claims priority, application United Kingdom, Sep. 19, 1986, 8622565

Int. Cl.[5] C11D *7/14, 11/02, 17/06;* C22D *1/14*

U.S. Cl. 252—174.25 **4 Claims**



1. A process for the production of a spray-dried detergent powder comprising crystalline or amorphous alkali metal aluminosilicate, and one or more anionic or nonionic detergent active compounds which process comprises the steps of

(i) spraying into a spray-drying tower an aqueous slurry comprising a crystalline or amorphous alkali metal aluminosilicate and 5 to 40% by weight of final powder of one or more anionic or nonionic detergent active compounds, and

(ii) simultaneously spraying an aqueous solution of alkali metal silicate separately into the tower, which solution contains at least 20% by weight of alkali metal silicate, whereby droplets of the alkali metal silicate solution encounter droplets of the slurry, or powder so as to form composite granules with alkali metal silicate at the exterior thereof.

4,965,016

GRANULAR CALCUIM HYPOCHLORITE COMPOSITION AND PROCESS FOR PREPARATION THEREOF

Hiroyuki Saitoh, Tokuyama, and Tsugio Murakami, Shinnanyo, both of Japan, assignors to Tosoh Corporation, Yamaguchi, Japan

Filed Nov. 3, 1988, Ser. No. 266,865

Claims priority, application Japan, Nov. 6, 1987, 62-279095

Int. Cl.[5] C01B *11/06*

U.S. Cl. 252—186.37 **9 Claims**

1. A granular calcium hypochlorite composition comprising a particle of at least one calcium hypochlorite compound selected from the group consisting of calcium hypochlorite dihydrate and calcium hypochlorite anhydride, said particle

having a structure in which the surface portion is substituted with a double decomposition product of calcium hypochlorite with an alkali metal hydroxide, said calcium hypochlorite dihydrate grown from seed crystals using, as the seed crystal, prismatic calcium hypochlorite dihydrate in which the lengths of axes a, b and c satisfy the requirements of $0.5 \leqq b/a \leqq 2.0$ and $c/a \geqq 1.5$ and the length of the axis c is at least 5 microns, and said calcium hypochlorite anhydride is prepared by dehydrating particles of said calcium hypochlorite dihydrate.

4,965,017

LIQUID CRYSTAL DEVICES

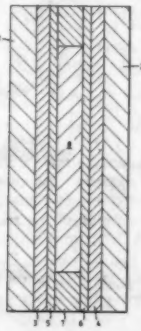
Paul Holmes, Bulkeley; Alan Nevin, Warrington, both of England; Hermann Amstutz, Mellingen, and Jurgen Nehring, Wettingen, both of Switzerland, assignors to Imperial Chemical Industries PLC, London, England and BBC Brown Boveri Ltd., Baden-Dattwil, Switzerland

Filed Jul. 13, 1988, Ser. No. 218,151

Claims priority, application United Kingdom, Jul. 13, 1987, 8716469

Int. Cl.[5] C09K *19/56;* **G02F** *1/13*

U.S. Cl. 252—299.4 **19 Claims**



1. A liquid crystal alignment layer supported upon a substrate, said alignment layer consisting essentially of a polyphenylene polymer prepared from a poly(1,2-disubstituted-cyclohexa-3,5-diene) prepolymer by aromatisation thereof to convert at least 98% of the 1,2-disubstituted-cyclohex-4-enylene rings of the prepolymer into phenylene rings.

4,965,018

OPTICALLY ACTIVE PYRIDYLETHANOL DERIVATIVE

Manabu Uchida, Kanagawa; Naoyuki Yoshida, and Masakazu Kaneoya, both of Chiba, all of Japan, assignors to Chisso Corporation, Ohsaka, Japan

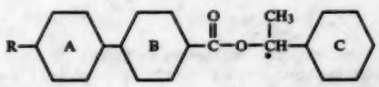
Filed Mar. 21, 1989, Ser. No. 326,795

Claims priority, application Japan, Apr. 6, 1988, 63-84671

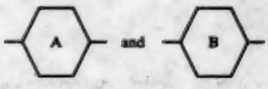
Int. Cl.[5] C09K *19/34;* **C07D** *403/00, 211/70*

U.S. Cl. 252—299.61 **8 Claims**

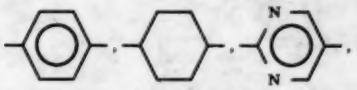
1. An optically active pyridylethanol derivative expressed by the formula

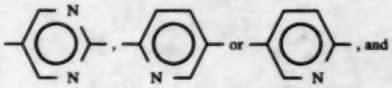


wherein R represents alkyl or alkoxy each of 1 to 20 carbon atoms,



each independently represent





represents 2-pyridyl, 3-pyridyl or 4-pyridyl.

4,965,019

USE OF SELECTED END-GROUP CLOSED FATTY ALCOHOL ETHOXYLATES FOR LOW-FOAM, COLD-SPRAYABLE CLEANING AGENTS

Karl-Heinz Schmid, Mettmann; Alfred Meffert, Monheim; Gilbert Schenker, Erkrath; Adolf Asbeck, and Juergen Geke, both of Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Filed Jan. 10, 1989, Ser. No. 295,334

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1988, 3800490

Int. Cl.[5] B01D *19/04;* **B08B** *9/28;* **C11D** *1/72, 1/823*

U.S. Cl. 252—321 **6 Claims**

1. The process of controlling the generation of foam from an alkaline to weakly acidic cleaning composition comprising adding to said composition from about 10 to about 2500 ppm of a polyethyleneglycol ether of formula I

$$R^1—O—(CH_2CH_2O)_n—R^2 \qquad (I)$$

in which R^1 represents a straight-chain or branched alkyl radical with 6 to 13 carbon atoms, R^2 represents an alkyl radical with 1 carbon atom, and n is a number of 2 or 3, as a foam-depressing additive, and spraying said composition as an aqueous solution at a temperature of less than about 25° C.

4,965,020

NON-LINEAR OPTICAL DEVICE

Simon Allen, Cheadle Hulme; Paul F. Gordon, Rochdale, and John O. Morley, Rochdale, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Feb. 4, 1987, Ser. No. 10,610

Claims priority, application United Kingdom, Feb. 4, 1986, 8602705

Int. Cl.[5] F21V *9/04*

U.S. Cl. 252—587 **3 Claims**

1. In a nonlinear optical device comprising an optical element which is capable of exhibiting second-order non-linear optical effects, said element comprising a compound of the formula:

$$D—B—N{=}O \qquad I$$

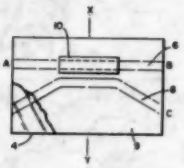
in which

B is selected from phenylene, naphthylene and biphenylene; and D is an electron donor of the formula

$$-(L)_l-(D')_m \qquad II$$

wherein

L is a benzene or naphthalene nucleus or conjugated alkylene or alkapolyene chain;



D' is selected from methoxy, methylthio, phenylthio, dimethylaminophenylthio, methylamino, and dimethylamino; l is 0 or 1; and m is 1, 2 or 3, said element comprising at least two monolayers of the compound of Formula I in each of which monolayers the molecules of the compound are aligned so that the element has a net non-centrosymmetry.

4,965,021

FLAME RETARDANT PLASTIC MATERIALS AND METHOD FOR PRODUCING SAME

Pierre Georlette, Omer; Hanoch Goren, Kiryat-Bialik; Shaul Shmilowitz, Beer-Sheva, and Avraham Teuerstein, Omer, all of Israel, assignors to Bromine Compounds Limited, Israel

Division of Ser. No. 201,341, May 31, 1988, Pat. No. 4,849,134, which is a continuation of Ser. No. 925,745, Oct. 30, 1986, abandoned. This application Jul. 13, 1989, Ser. No. 379,235

Claims priority, application Israel, Nov. 13, 1985, 77034; Sep. 12, 1986, 80021

Int. Cl.[5] C09K *21/00*; C09D *5/16, 5/18*; C08K *3/10*

U.S. Cl. 252—609 **32 Claims**

1. A process for producing flame-retardant plastic materials comprising:

mixing a plastic material to which flame-retardant properties are to be imparted with cold compacted granules comprising one or more halogenated hydrocarbon flame-retardant compounds, which granules have a particle size between about 2 and about 4 mm and are substantially free of a binder material that does not possess flame-retardant properties; and

heating said mixture so that said plastic material is substantially melted.

4,965,022

PROCESS FOR DISSOLVING A GAS IN A LIQUID

Lawrence M. Litz, Pleasantville, N.Y., assignor to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.

Continuation of Ser. No. 68,529, Jul. 1, 1987, abandoned. This application Jan. 16, 1990, Ser. No. 465,409

Int. Cl.[5] B01F *3/04*

U.S. Cl. 261—36.1 **35 Claims**

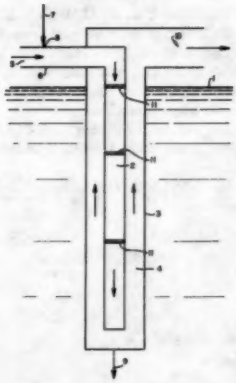
1. An improved process for dissolving a gas in a liquid comprising:

(a) injecting the gas to be dissolved into a stream of said liquid at an initial, relatively low pressure to form a dispersion of gas bubbles in said liquid;

(b) passing said liquid stream containing gas bubbles in a generally downward flow path, thereby increasing the pressure on said liquid, thereby increasing the solubility and the dissolution rate of the gas in the liquid;

(c) exposing said liquid stream to flow restriction means located within the internal portion of said stream throughout its passage through said downward flow path to assure uniform dispersion of gas bubbles, and enhanced gas dissolution, in said liquid stream throughout said downward flow path, said flow restriction means being positioned at spaced intervals along the length of said downward flow path;

(d) continuing the passage of said liquid stream containing dissolved and dispersed gas in said downward flow path containing said flow restriction means for a residence time, as determined by the diameter and length of said downward flow path and the flow rate of said stream, to facilitate said dissolving of the gas in the liquid; and



(e) recovering said liquid stream containing dissolved gas and any residual dispersed gas bubbles at the prevailing temperature and pressure at a point of recovery, the dissolved gas concentration of the recovered liquid stream being greater than the dissolved gas concentration level at the beginning of said downward flow path,

whereby the desired gas dissolution can be accomplished with desirably low pump energy requirements and enhanced overall process efficiency.

4,965,023

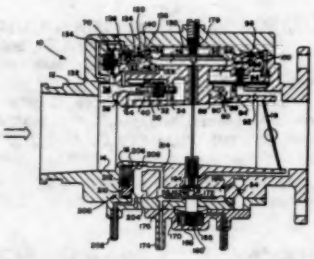
CARBURETOR HAVING BIDIRECTIONAL FUEL PASSAGE

James S. Jones, Richardson, Tex., assignor to David Ward

Filed Apr. 7, 1989, Ser. No. 339,250

Int. Cl.[5] F02M *7/20*

U.S. Cl. 261—34.2 **6 Claims**



1. A bidirectional fuel passage carburetor for an internal combustion engine, the carburetor being connected to a source of liquid fuel for establishing a fuel supply for the engine at an air-fuel ratio and being connected to the engine by an intake manifold, comprising:

means for compensating for changes in air density;
means for eliminating air bounce of an air diaphragm resulting from pressure pulses in said intake manifold;
means for rapidly enriching said fuel supply upon load increase;
warm up means responsive to below normal operating temperatures for increasing idle air flow and enriching said fuel supply;
means for shutting off said connection to said source of liquid fuel when said engine is shut off; and
means for adjusting said air-fuel ratio in compensation for ambient air temperature changes.

4,965,024

PRODUCTION OF CERAMIC NUCLEAR FUEL PELLETS

Geoffrey A. Wood, Preston, United Kingdom, assignor to British Nuclear Fuels plc, Warrington, England

Filed Oct. 14, 1988, Ser. No. 257,964
Claims priority, application United Kingdom, Oct. 20, 1987, 8724514
Int. Cl.[5] C21C *21/00*
U.S. Cl. 264—0.5 **21 Claims**

21. A method of producing ceramic nuclear fuel pellets comprising:

a. mixing ceramic grade uranium dioxide powder with essentially single crystals comprising uranium dioxide, the powder having a specific surface area of between 2 and 3 m^2g^{-1}, and the crystals having a particle size less than 37 microns and being between 2% and 5% by weight in the mixture;
b. forming granules from the mixture and pressing the granules to form pellets;
c. heating the pellets to a sintering temperature of between 2000° C. and 2200° C. in a reducing environment comprising hydrogen and at a rate of heating between 600° C. and 700° C. min^{-1};
d. holding the pellets at the sintering temperature for between 200 and 500 seconds, and
e. rapidly cooling the sintered pellets between 2100° C. and 1600° C. at a rate between 850° C. and 1000° C. min^{-1},

whereby a densification above 96% theoretical density is achieved by said sintering.

4,965,025

PROCESS FOR MICROENCAPSULATING HYDROPHOBIC OILS, THE MICROCAPSULES OBTAINED AND THE USE THEREOF

Günter Pietsch, Isernhagen, and Karl-Heinz Schrader, Hanover, both of Fed. Rep. of Germany, assignors to Papierfabrik August Koehler AG, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 922,591, Oct. 24, 1986, Pat. No. 4,824,823. This application Mar. 18, 1988, Ser. No. 169,630
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1987, 3709586
Int. Cl.[5] B01J *13/02*
U.S. Cl. 264—4.7 **18 Claims**

1. A process for microencapsulating hydrophobic oils within a microcapsule envelope in an aminoplast system, comprising the steps of:

preparing a first strongly acidic aqueous solution of a cationic melamine/formaldehyde precondensate that is water insoluble under weak acid, neutral and alkaline conditions,
stirring said first acidic aqueous solution under highly turbulent conditions,
instantaneously precipitating said cationic melamine/formaldehyde precondensate as a very fine solid suspension, by decreasing the acidity of said first acidic aqueous solution during said highly turbulent stirring and in the absence of a water-soluble polymer,
adding a hydrophobic oil containing a color reactant in solution, with highly turbulent stirring, to rapidly form a stable oil-in-water dispersion of said oil in said aqueous solution,
acidifying the oil-in-water dispersion thus obtained and adding a second aqueous solution of a water-soluble non-ionic melamine/formaldehyde precondensate, with laminar stirring, and
condensing said non-ionic melamine/formaldehyde precondensate to form the microcapsule envelope, thereby encapsulating said dispersed oil.

4,965,026

PROCESS FOR HYDROXYLATING HYDROPHOBIC POLYMER SURFACES

Robert A. Janssen, Alpharetta, Ga., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 13, 1989, Ser. No. 297,020
Int. Cl.[5] C08J *7/12*; B29D *11/00*; B29C *71/04*
U.S. Cl. 264—22 **7 Claims**

1. A process for treating the surface of a hydrophobic polymer to form hydroxyl groups thereon which comprises

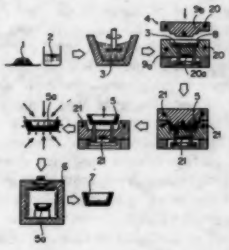
ozonating the polymer surface to form peroxy and hydroperoxy groups thereon, and then
exposing the ozonated surface to ultraviolet light or heat to convert the peroxy and hydroperoxy groups to hydroxyl moieties in the presence of a hydrogen donor.

4,965,027

METHOD FOR THE FREEZE-PRESSURE MOLDING OF INORGANIC POWDERS

Nobuyuki Takahashi, Saitama, Japan, assignor to Mitsubishi Corporation, Tokyo, Japan

Continuation of Ser. No. 52,757, May 20, 1987, abandoned, which is a continuation of Ser. No. 722,183, Apr. 10, 1985, abandoned. This application Dec. 16, 1988, Ser. No. 286,366
Claims priority, application Japan, Apr. 12, 1984, 59-73641
Int. Cl.[5] C04B *35/64*
U.S. Cl. 264—28 **5 Claims**



1. A method of molding inorganic powders under freeze-pressure to make a freeze-molded product and subsequently a mechanical part from ceramic of high purity, high density and high precision, comprising the steps of using ceramic powders having an average particle diameter of no greater than 1 micrometer in average size, and adding 25 to 50 vol % thereto of an inorganic fluid which freezes tat temperatures of about 0° C. and is easily sublimed after freezing so that said fluid does not remain in a sintered product, and kneading so as to form a thin film of said inorganic fluid on said ceramic powders and to form a mixture; filling said kneaded mixture into a mold having a predetermined cavity, applying compressive pressure of more than 200 kgf/cm^2 to said kneaded mixture in said mold and during said applying rapidly cooling said mixture by cooling means provided in said mold; releasing the freeze-molded product from the mold; drying the freeze-molded product after withdrawing from the mold; and sintering it.

4,965,028

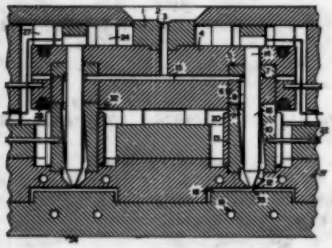
METHOD OF INJECTION MOLDING THERMOPLASTIC THROUGH MULTIPLE GATES

Steven M. Maus, Osseo, and George J. Galic, Columbia Heights, both of Minn., assignors to Galic/Maus Ventures, Columbia Heights, Minn.

Continuation of Ser. No. 93,355, Sep. 4, 1987, abandoned. This application May 10, 1989, Ser. No. 352,700

Int. Cl.[5] B29C *45/22*

U.S. Cl. 264—297.2 7 Claims



1. In a multicavity injection molding process, a method for improving a thermoplastic's melt quality and increasing melt temperature entering a gate of each cavity of a multicavity mold and thereby improving molded part quality, wherein said improvement is achieved by the method of:

(a) injecting a plasticated melt under pressure through a nozzle seated in a sprue bushing into a multicavity moldset melt delivery system, said delivery system including melt passageways maintained continuously in fluid communication between the sprue bushing on an upstream end and runner bushings feeding into each mold cavity on a downstream end, the melt contained in the delivery system is intermittently pressurized and depressurized with each injection cycle, and the melt always retains sufficient fluidity to flow as required when next pressurized;

(b) displacing said melt contained in the delivery system downstream toward the mold cavities, upon each cycle's melt pressurization, the melt must pass through en route melt conditioning elements located upstream of each gate and downstream of each melt passageway, each conditioning element consisting of a male device member of generally torpedo shape housed concentrically within a generally cylindrically shaped female bushing member, a precisely dimensioned annular clearance space between the male and female members, each conditioning element defining longitudinally at least one inlet melt channel which is longitudinally substantially blocked at its downstream end and at least one outlet melt channel which is longitudinally substantially blocked at its upstream end, and said inlet and outlet melt channels are maintained in fluid communication through said precisely dimensioned clearance space defining a constrictive land interposed therebetween, such that melt transferring between said inlet and outlet melt channels must pass over said constrictive land and, furthermore, said melt transferring therebetween must undergo substantial angular change in flow direction as said inlet and outlet melt channels are not coaxially aligned, and each melt conditioning element feeding the melt directly into the gate;

(c) shearing substantially the melt as it flows during the intermittent pressurization of each cycle, within said melt conditioning elements, thereby increasing the melt temperature and mixing the melt by angular flow direction change as the melt is transferred through said constrictive land within said melt conditioning elements; and

(d) heating at least one of said male and female members of each melt conditioning element comprising heating said melt conditioning elements to a temperature greater than a temperature of the melt measured upstream of the melt conditioning elements and forcing intimate contact between the melt and said heated members at least during the intermittent pressurization, thereby increasing heat transfer between said melt and said heated members and increasing melt temperature downstream of said melt conditioning elements whereby the melt entering each mold cavity has substantially greater homogeneity, fluidity, and heat content with very minimally increased heat history.

4,965,029

PROCESS FOR PREPARING POLYURETHANE FOAMS HAVING ZONES OF DIFFERING HARDNESS

Werner A. Lidy, Geneva, and Rudolf J. Tenhagen, Longirod, both of Switzerland, assignors to Polyol International BV, Horgen, Switzerland

PCT No. PCT/GB87/00464, § 371 Date Jan. 22, 1988, § 102(e) Date Jan. 22, 1988, PCT Pub. No. WO88/00131, PCT Pub. Date Jan. 14, 1988

Continuation-in-part of Ser. No. 468,058, Feb. 9, 1983, Pat. No. 4,714,574. This PCT application Jul. 2, 1987, Ser. No. 150,642

Claims priority, application United Kingdom, Jul. 2, 1986, 8616132

The portion of the term of this patent subsequent to Dec. 22, 2004, has been disclaimed.

Int. Cl.[5] B29C *67/22*

U.S. Cl. 264—45.1 6 Claims

1. A process for the production of a moulded flexible polyurethane foam article comprising a firm polyurethane foam encapsulated in a soft polyurethane foam which process comprises introducing into a mould a soft foam formulation; allowing the soft foam formulation to rise and expand its volume by between 100% and 2300% and thereafter introducing a hard foam formulation onto the soft foam formulation, wherein the improvement comprises that the hard foam formulation comprises a polyfunctional isocyanate, a polyfunctional alcohol, a blowing agent and sufficient frothing agent to cause the hard foam formulation, when introduced onto the soft foam formulation, to have frothed to the extent that the density of the hard foam formulation is between 75 and 145% of the density of the soft foam formulation.

4,965,030

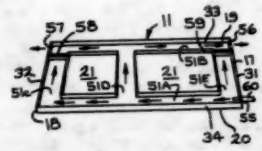
METHOD OF FORMING A COMPRESSION MOLDED DOOR ASSEMBLY

John E. Thora, Sylvania, Ohio, assignor to Therma-Tru Corp., Toledo, Ohio

Division of Ser. No. 207,173, Jun. 15, 1988, Pat. No. 4,860,512. This application Jun. 8, 1989, Ser. No. 363,603

Int. Cl.[5] B29C *67/22*

U.S. Cl. 264—46.5 4 Claims



1. A method of forming a door assembly having members joined to form a chamber consisting of a series of passageways, an inlet aperture and a plurality of venting apertures and a foam core in said chamber comprising the steps of introducing foamable material in flowable form into one of said passageways through said inlet aperture, directing the flow of said foamable material through said passageway, blocking the flow of said foamable material in at least one passageway to selec-

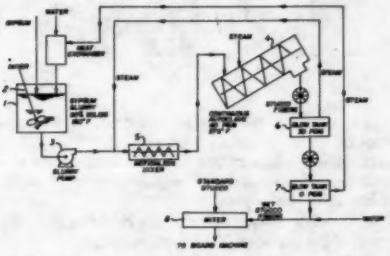
tively direct the flow of foamable material through said passageways and prevent foamable material from flowing out of all of the venting apertures prior to the chamber being completely filled with said foamable material, and causing said foamable material to form said foam core.

4,965,031

CONTINUOUS PRODUCTION OF GYPSUM BOARD

Alan P. Conroy, St. Petersburg, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Filed Feb. 24, 1989, Ser. No. 315,061
Int. Cl.[5] B32B *13/08*
U.S. Cl. 264—122 13 Claims



1. A continuous process for the formation of gypsum board which comprises:

(a) forming an aqueous suspension of gypsum,

(b) converting the gypsum in the suspension to a calcined product by reaction in a pressure vessel in the presence of saturated steam at a temperature greater than about 110° C. for a period of time sufficient for conversion of all or a portion of the gypsum to fibrous calcium sulfate hemihydrate,

(c) forming an aqueous suspension of the calcined product of step (b) with non-,fibrous calcium sulfate hemihydrate calcined at normal atmospheric pressure, and

(d) forming the suspension of step (c) into a desired gypsum board shape, wherein the density of the gypsum board is inversely proportional to the amount of the fibrous calcium sulfate hemihydrate added in step (c).

4,965,032

FILTER DEVICE WITH NON-BYPASS EDGE SEAL

David B. Pall, Roslyn Estates, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Sep. 15, 1989, Ser. No. 407,759
Int. Cl.[5] B29D *9/00*
U.S. Cl. 264—160 7 Claims

1. A process for the production of a filter unit, said filter unit comprising at least one nonwoven fibrous filter disc element in a tight fit with the interior wall of a cylindrical filter housing made from a material with a positive coefficient of expansion at temperatures from about 0° to about 100° C. of at least about 3×10^{-5}/°C., comprising:

(a) compressing a sheet of a non-woven fibrous material while in a heat softened state to a desired density;

(b) cutting a filter element disc from such compressed sheet with a diameter from about 0.2 to about 1% greater than the interior diameter of the filter housing at ambient temperature;

(c) heating the housing to an elevated temperature at which its interior diameter exceeds the diameter of the disc at ambient temperature;

(d) inserting the filter element disc into the housing while maintaining the housing at the elevated temperature; and

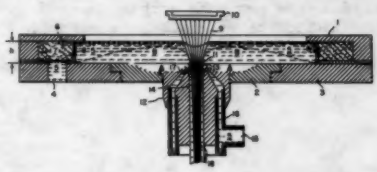
(e) allowing the assembly to cool to ambient temperature.

4,965,033

PROCESS FOR SPINNING HIGH-STRENGTH, HIGH-MODULUS AROMATIC POLYAMIDES

Mishon J. Chiou, Richmond, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 26, 1990, Ser. No. 498,936
Int. Cl.[5] D01D *5/14;* D01F *6/60*
U.S. Cl. 264—180 5 Claims



1. In a process for preparing high-strength, high-modulus aromatic polyamide filaments by extruding an acid solution containing at least 30 g per 100 ml acid of an aromatic polyamide having an inherent viscosity of at least 4 and chain-extending bonds which are either coaxial or parallel and oppositely directed through a layer of inert noncoagulating fluid into a coagulating bath and then through a spin tube along with overflowing coagulating liquid, by jetting additional coagulating liquid symmetrically about the filaments in a downward direction forming an angle of 0° to 85° with respect to the filaments within about 2.0 milliseconds from the time the filaments enter the spin tube, by maintaining constant the flow rates of both the jetted and the overflowing coagulating liquids, and winding up the filaments, the improvement comprising employing a mass-flow ratio of the mass-flow rate of combined coagulating liquid to mass-flow rate of the filaments of greater than about 250, employing a momentum ratio of jetted to overflowing coagulating liquids of greater than about 6.0, and maintaining an average linear velocity of combined coagulating liquids in the spin tube which is less than the velocity of the filaments exiting from the spin tube.

4,965,034

BLENDS AND FILMS OF LINEAR ETHYLENE POLYMERS WITH POLYURETHANE AND METHOD OF THEIR EXTRUSION

Richard G. Shaw, Remsen, N.Y., and Tien-Kuei Su, Belle Mead, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 91,578, Aug. 31, 1987, abandoned. This application Feb. 6, 1989, Ser. No. 307,142
Int. Cl.[5] D01F *1/02;* C08L *75/00*
U.S. Cl. 264—211 24 Claims

1. A composition comprising a blend of LLDPE and up to 5 weight percent of a thermoplastic polyurethane polymer sufficient to reduce extruder torque and head pressure encountered in the extrusion of said LLDPE.

4,965,035

METHOD OF PREFORMING A COVER MEMBER OF A CAN-SHAPED CONTAINER

Kiyokazu Ishiwatari; Yoshitsugu Hamada, and Osamu Yamada, all of Kanagawa, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 84,787, Aug. 13, 1987, abandoned. This application Oct. 6, 1989, Ser. No. 418,937
Claims priority, application Japan, Aug. 13, 1986, 61-188694
Int. Cl.[5] B29C *45/16*
U.S. Cl. 264—268 2 Claims

1. A method of forming a cover member, comprising the steps of:

forming a plate-like base having a barrier layer and synthetic

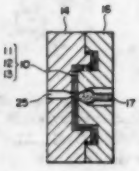
resin layer heat fused to at least one side of said barrier layer;

mounting said base onto an upper portion of a first preforming metal mold formed with a cylindrical recess, said recess having a diameter smaller than a diameter of said base;

pressing an outer peripheral end portion of said base toward an outer portion of said first metal mold;

mounting a second preforming metal mold onto said base;

urging said second metal mold into said recess of said first metal mold, so as to softly press said base with moderate force into said recess of said first metal mold, wherein when said second metal mold is urged into said recess, said base is held in a loose condition so that stretching of said



base is substantially prevented, and thereby forming from said base a provisionally preformed cover member having a central disk-shaped lid portion, a barrel portion extending from a periphery of said lid portion perpendicular thereto, and a flap portion extending outward from an outer periphery of said barrel portion perpendicular to said barrel portion;

placing said provisionally preformed cover member in an injection mold; and

injecting one of a thermoplastic resin and a thermosetting resin compound onto said base in said injection mold such that said resin compound forms an inverted U-shaped portion which surrounds said barrel portion and said flap portion.

4,965,036

METHOD OF LINING A PIPE WITH A TUBE INCLUDING PASSING HEATED FLUID THROUGH THE BORES OF THE TUBE

Yasuo Miyazaki, Osaka, and Akira Kamide, Higashiosaka, both of Japan, assignors to Osaka Bousi Construction Co., Ltd., Osaka, Japan

Filed Apr. 4, 1989, Ser. No. 332,905

Claims priority, application Japan, Apr. 12, 1988, 63-90771; Jun. 7, 1988, 63-141178

Int. Cl.[5] B29C *63/34*

U.S. Cl. 264—269 **5 Claims**

1. A method of lining a pipe with a plastic tube, the tube being one of a rigid plastic tube or a semirigid plastic tube, said tube having a large wall thickness and is formed with a multiplicity of bores extending through the tube wall axially thereof and arranged in parallel at a spacing circumferentially of the tube, said method ofl ining a pipe comprising the steps of:

inserting the tube through the pipe;

passing a heating fluid through the bores of said tube;

heating said tube from inside said walls of the tube with said heating fluid until said tube is softened; and

pressurizing an interior of the tube to inflate the tube to uniformly line the pipe while continuing to heat the tube with the heating fluid inthe bores of the tube.

4,965,037

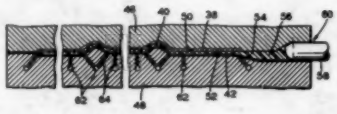
METHOD OF MOLDING A COMPOSITE

William R. Weaver, and James E. Matzinger, both of Toledo, Ohio, assignors to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Jul. 17, 1989, Ser. No. 380,888

Int. Cl.[5] B29C *45/14*

U.S. Cl. 264—511 **27 Claims**



1. A process for preparing a molded composite, comprising the steps of:

(A) providing at least two cooperating mold sections having surfaces which cooperate to define a mold cavity for molding the composite;

(B) positioning a layer of a surface finishing film adjacent each of the surfaces of the mold sections;

(C) positioning a substrate between the mold sections and intermediate the layers of surface finishing film;

(D) closing the mold sections; and

(E) injecting polymeric precursors into the mold cavity between the substrate and the layers of surface finishing film so as to form a layer of polymeric precursors between apposing major surfaces of the substrate and the layers of surface finishing film, the polymeric precursors filling the mold cavity and simultaneously deforming the layers of surface finishing film to conform to the surfaces of the mold sections, the polymeric precursors reacting in situ to form a polymeric layer and simultaneously chemically bond the polymeric layer to the layers of surface finishing film.

4,965,038

LAMINATED COMPOSITE OF A RIGID POLYURETHANE MODIFIED POLYISOCYANURATE SUBSTRATE AN METAL, PLASTIC, CELLULOSE, GLASS, CERAMIC OR COMBINATIONS THEREOF

Usama E. Younes, Newtown Square, Pa., assignor to Arco Chemical Technology, Inc., Wilmington, Del.

Division of Ser. No. 88,748, Aug. 24, 1987, Pat. No. 4,886,700. This application Sep. 15, 1989, Ser. No. 407,593

Int. Cl.[5] B29D *22/00*

U.S. Cl. 264—552 **10 Claims**

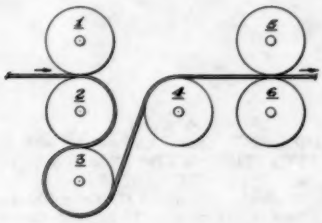
1. A method for preparation of a laminated composite which comprises forming in combination in a mold cavity at least one layer of a rigid polyurethane modified polyisocyanurate thermoset composition prepared by reacting in said mold at temperatures of from about ambient to about 140° C. a reaction mixture of an organic di- or polyisocyanate, from about 2 to about 50 parts by weight of a cyclic alkylene carbonate and from about 2 to about 50 parts by weight of a polyether polyol based on the isocyanate-carbonate-polyol mixture, and in the presence of a soluble adduct of a tertiary amine and a cyclic alkylene carbonate as catalyst at a concentration of from about 0.005 to about 5.0 weight percent based on the total composition, and at least one layer of a material selected from the group consisting of metal, plastic, cellulose, glass and ceramic or combinations thereof.

4,965,039

METHOD OF PREPARING AN AQUEOUS INORGANIC POWDER SLURRY WHICH IS EXTRUDED AND DRIED TO FORM AN INORGANIC ARTICLE

James E. Schuetz, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 2, 1988, Ser. No. 239,881
Int. Cl.[5] B29C 47/88
U.S. Cl. 264—553 26 Claims



1. A method of preparing an inorganic powder slurry which comprises:

(a) admixing an inorganic powder, water and a dispersant to form a blend,

(b) ball milling said blend,

(c) heating said blend so that the temperature of the blend is greater than the gelation point of the thermally gelable polymer binder to be subsequently admixed in step (d),

(d) admixing said heated blend with a thermally gelable polymer binder to form a slurry mixture, wherein the thermally gelable polymeric binder is effectively dispersed in the slurry, and wherein said slurry mixture has from about 70 to about 90 weight percent solids, and

(e) cooling said slurry mixture.

14. A method of extruding a flexible article comprising

(a) extruding an inorganic slurry mixture containing a dispersant, a thermally gelable polymeric binder, and water through a die to form a flexible formed article, wherein said slurry mixture has from about 70 to about 90 weight percent solids, and

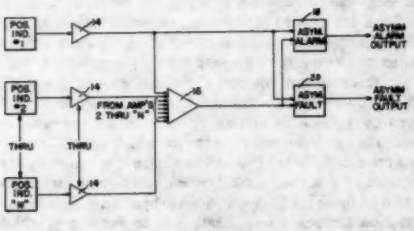
(b) final shaping the configuration of said formed article by passing said article through a heated calendar roll stack assembly, wherein said heated calendar rolls are heated to a temperature effective to thermally gel the binder and remove the solvents from the article, thereby final shaping said article.

4,965,040

MAXIMUM/MINIMUM ASYMMETRIC ROD DETECTION

John T. Huston, Lancaster, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Apr. 13, 1989, Ser. No. 337,506
Int. Cl.[5] G21C 7/36, 17/00
U.S. Cl. 376—236 6 Claims



1. A system for determining the relative position of each control rod within a control rod group in a nuclear reactor, said control rod group having at least three control rods therein, comprising:

means for producing a signal representative of a position of each control rod within the control rod group in the nuclear reactor;

means for establishing a signal representative of the highest position of a control rod in the control rod group in the nuclear reactor;

means for establishing a signal representative of the lowest position of a control rod in the control rod group in the nuclear reactor;

means for determining a difference between said signal representative of the position of the highest control rod and the signal representative of the position of the lowest control rod;

means for establishing a predetermined limit for said difference between said signal representative of the position of the highest control rod and said signal representative of the position of the lowest control rod; and

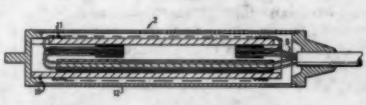
means for comparing said difference between said signals with said predetermined limit, said comparing means producing an output signal when said difference between said signals exceeds said predetermined limit.

4,965,041

INSTRUMENT FOR MONITORING THE COOLING CONDITIONS IN A LIGHT WATER REACTOR

Kurt Becker, Illerstigen 16, S-171 71, Solna, Sweden

Filed Dec. 11, 1987, Ser. No. 132,071
Int. Cl.[5] G21C 17/02
U.S. Cl. 376—258 7 Claims



1. Instrument for detecting loss of coolant in the reactor vessel of a light water reactor, comprising a probe (2) insertable into the reactor vessel and adapted under normal operating conditions be immersed in said coolant, wherein the probe (2) comprises a casing (12) made of water resistant material, a wire coil resistor concentric to said probe (3) hermetically encapsulated in said casing (12) and connected to a power supply means (5), the resistance of the resistor (3) being dependent on the resistor temperature, a heat transfer medium arranged between the inner wall of the casing (12) and the resistor (3), power supply means attached directly to said resistor via a pair of wires, sensing means separately attached directly to said resistor via a separate pair of wires providing an output signal, which is dependent on the resistance of the resistor (3) when current flows through the resistor, and further including means to supply sufficiently high power to said resistor to heat such to an extent that such heat is dissipated by said coolant under normal operating conditions, whereby the temperature of said resistor is substantially constant, and such that when said resistor is not covered by said coolant, its temperature rapidly increases and such increase is measurable by said sensing means whereby identifying a loss of coolant, and switching means (7) by means of which the resistor (3) is connected to at least one power source capable of providing at least two different power levels.

4,965,042

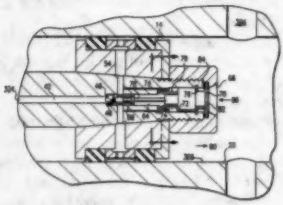
INHERENTLY FLUSHING PISTON ROD FOR A RECIPROCATING PUMP

Dragan Besic, West Caldwell, and Wilbur C. Smith, North Caldwell, both of N.J., assignors to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 307,401, Feb. 7, 1989. This application Feb. 2, 1990, Ser. No. 474,156

Int. Cl.[5] F04B *21/00*

U.S. Cl. 417—437 9 Claims



1. An inherently flushing piston rod for use in a reciprocating pump, said piston rod comprising:

a piston portion having an axial bore formed therethrough, said axial bore having a first end and a second end, said first end of said axial bore lying in fluid contact with the external environment of said piston portion;

a flexible diaphragm disposed within said axial bore through said piston portion whereby said flexible diaphragm and said piston portion define a reserve flushing zone;

a pair of annular wiper elements extending radially from said piston portion, said annular wiper elements and said piston portion defining an annular flushing space therebetween;

said piston portion having a radially-extending channel formed therethrough, said radially-extending channel fluidly connecting said axial bore through said piston portion and said annular flushing space; and

a means for providing flushing fluid to said second end of said axial bore through said piston portion;

a means for preventing flow from said axial bore through said piston portion to said means for supplying flushing fluid.

4,965,043

METHOD OF POWDER-METALLURGICAL PRODUCTION OF OBJECTS, SPECIFICALLY OF TUBES, RODS, OR THE LIKE

Claes Tornberg, Höganäs, Sweden, assignor to Avesta Nyby Powder AB, Sweden

PCT No. PCT/EP88/00443, § 371 Date Jan. 23, 1989, § 102(e) Date Jan. 23, 1989, PCT Pub. No. WO88/09235, PCT Pub. Date Dec. 1, 1988

PCT Filed May 19, 1988, Ser. No. 328,584

Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717154

Int. Cl.[5] B22F *7/00*

U.S. Cl. 419—8 8 Claims

1. A method of powder-metallurgical production of objects, specifically tubes, rods, or the like, wherein a metal powder including powders selected from a metal and/or a metal alloy is charged into a thin-walled capsule, said capsule wall being formed of material including carbon steel, the capsule is then closed and exposed to a cold-isostatic pressure so as to form a pressing for subsequent hot-working, specifically hot extrusion,

comprising the improvement including

introducing a nitrogen and hydrogen gas mixture into the capsule together with said metal powder simultaneously pre-compacting said powder to about a density of 60 to 80% of the theoretical density, closing the capsule, and subjecting said pre-compacted capsule to a cold-isostatic pressure for compaction up to about 95% of the theoretical density, and testing said compacted capsule for leakage of hydrogen in a a vacuum chamber prior to heating and hot-working.

4,965,044

METHOD OF SINTERING CERAMICS AND METAL DISPERSED REINFORCED CERAMICS OBTAINED THEREBY

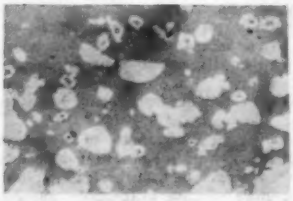
Yoshinari Miyamoto, Kamo 3-3-32, Kawanishi-shi, Hyogo; Osamu Yamada, Kurotani 513, Yao-shi, Osaka; Mitsue Koizumi, Tamaicho 3-6-22, Toyonaka-shi, Osaka; Osamu Komura, Hyogo; Eiji Kamijo, Hyogo; Masaaki Honda, Hyogo, and Akira Yamakawa, Hyogo, all of Japan, assignors to I. Sumitomo Electric Industries, Ltd., Osaka; Yoshinari Miyamoto, Hyogo; Osamu Yamada and Mitsue Koizumi, both of Osaka, all of, Japan

Division of Ser. No. 158,115, Feb. 16, 1988, Pat. No. 4,906,295, which is a continuation of Ser. No. 735,206, May 17, 1985, abandoned. This application Aug. 11, 1989, Ser. No. 392,287

Claims priority, application Japan, May 18, 1984, 59-100893; May 18, 1984, 59-100894; May 18, 1984, 59-100895; May 18, 1984, 59-100896

Int. Cl.[5] B22F *3/00*

U.S. Cl. 419—12 6 Claims



1. A method of sintering ceramics comprising simultaneously synthesizing and sintering ceramics utilizing the reaction heat generated when at least one metal selected from the group consisting of metallic elements of Groups IIIb and IVb, except for Ti, Vb and VIb of the Periodic Table, is combined with at least one non-metallic material made from elements selected from the group consisting of B, C and N, said reaction being carried out by pressing the mixture of metallic and non-metallic elements at high pressures sufficient to form a pressed body having a porosity of 30% or less and then heating a part of said pressed body at temperatures substantially lower than the temperature required to sinter the ceramics to start the synthetic reaction to produce the ceramics, whereby there is induced a synthetic reaction of the parts adjacent to the part heated as a result of the reaction heat generated by the synthetic reaction and wherein the entire pressed body is ultimately converted to a sintered ceramics, and controlling the speed of reaction by adding powders of the ceramics to be synthesized or powders of ceramics which are different from the ceramics to be synthesized as a diluent to control the temperature of reaction, such pressed body being preliminarily heated by means of an electron-beam heating, a high-frequency induction heating, a laser heating or by heating in which an assistant combustion agent is employed to initiate the reaction.

4,965,045

COPPER-BASED ALLOY FOR OBTAINING ALUMINUM-BETA-BRASSES, CONTAINING GRAIN SIZE REDUCING ADDITIVES OF TITANIUM AND NIOBIUM

Andrea Giarda, and Sergio Ceresara, both of Florence, Italy, assignors to Europe Metalli - LMI S.p.A., Florence, Italy

Filed Dec. 21, 1988, Ser. No. 288,005
Claims priority, application Italy, Dec. 23, 1987, 68115 A/87
Int. Cl.[5] C22F *1/08*
U.S. Cl. 420—478 2 Claims

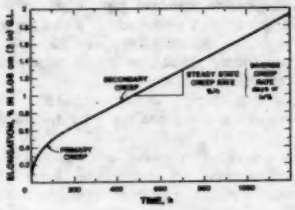
1. A copper-based metal alloy for obtaining aluminium-Beta-brasses, comprising from 5% to 35% by weight of zinc, from 1% to 10% by weight of aluminium and a total lying between 0.01% and 0.2% by weight of niobium and titanium, the remainder being copper and incidental impurities and other alloying elements, the ratio by weight between the quantity of niobium and that of titanium contained in the said alloy being substantially equal to unity, and said aluminium, niobium and titanium forming a ternary Al-Nb-Ti intermetallic compound that promotes reduced grain size and increased resistance to thermomechanical fatigue.

4,965,046

CREEP RESISTANT ZINC-ALUMINUM BASED CASTING ALLOY

Robert J. Barnhurst, Pointe-Claire, Canada, assignor to Noranda Inc., Toronto, Canada

Filed Apr. 6, 1989, Ser. No. 333,894
Claims priority, application Canada, Oct. 4, 1988, 579310
Int. Cl.[5] C22C *18/04*
U.S. Cl. 420—519 9 Claims



1. A creep resistant zinc-aluminum based casting alloy consisting essentially of, in weight percent, 3–18% aluminum, 0.01–0.15% magnesium, and manganese and lithium in the concentrations between 0.01–0.05% Mn and 0.02–0.1% Li, the balance being zinc except for impurities commonly found in zinc alloys.

4,965,047

ANALYTICAL TEST STRIP

John M. Hammond, Wantage, England, assignor to CMB Foodcan p.l.c., England

Filed Feb. 17, 1988, Ser. No. 156,837
Claims priority, application United Kingdom, Feb. 17, 1987, 8703578; Nov. 23, 1987, 8727369
Int. Cl.[5] G01N *31/22, 21/00*
U.S. Cl. 422—58 20 Claims

1. An analytical test strip comprising

an elongated layer of absorbent material along which liquid may pass,

upper and lower layers of liquid impermeable material sandwiching the absorbent layer therebetween, said liquid impermeable material being interrupted to enable a test substance to be brought into contact with the absorbent layer at a predetermined position therealong, and said liquid impermeable material including a viewing window through which the absorbent layer is visible for detecting a color or tone change indicating a predetermined condition of a test substance introduced at said predetermined position and having passed along the absorbent layer with one or more reagent or carrier liquids to said viewing window or region,

a deformable blister defined by said liquid impermeable material in a position overlying the absorbent layer and holding at least one reagent or carrier liquid, and

a liquid impermeable but rupturable diaphragm separating the blister from the absorbent layer and closing the blister with each said reagent or carrier liquid therein,

said blister, said viewing window and said predetermined position for introducing the test substance being spaced apart along the test strip with said viewing window being nearest one end of the test strip, the blister having at least one integral spike formed on said liquid impermeable material and defining an inner surface portion of said blister and extending to a free end adjacent the diaphragm, whereby the diaphragm is rupturable by each spike on deformation of the blister to allow the reagent or carrier liquid to leave the blister through the opening thus formed in the diaphragm and to contact the absorbent layer.

4,965,048

THIN-LAYER CHROMATOGRAPHY FLAME IONIZATION DETECTOR FOR QUANTITATIVE ANALYSIS OF CHROMATOGRAPHICALLY-SEPARATED SUBSTANCES

Minoru Ogasawara, Tokyo, Japan, assignor to Iatron Laboratories, Inc., Tokyo, Japan

Continuation of Ser. No. 120,348, Nov. 13, 1987, abandoned.
This application Sep. 25, 1989, Ser. No. 412,629
Claims priority, application Japan, Apr. 13, 1987, 62-088702
Int. Cl.[5] G01N *21/72*
U.S. Cl. 422—54 4 Claims

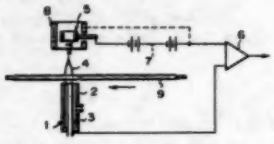
1. A flame ionization detector used in thin-layer chromatography, comprising:

a gas burner connected to a means for providing a source of hydrogen gas to form a hydrogen flame at the nozzle of the burner, a thin-layer chromatographic element which carries chromatographically-separated substances and located such that it passes through the hydrogen flame to burn and ionize the separated substances;

a first electrode positioned such that it is exposed to an

ionized gas caused by the burning of the separated substances with the hydrogen flame;

means defining an electric source said electric source means having a positive side and a negative side and being connected to said burner and to said first electrode for applying a voltage between said hydrogen gas burner and said first electrode whereby said hydrogen gas burner is given a positive polarity and said first electrode is given a negative polarity, whereby said burner forms a second electrode which functions as a positive electrode;



a third electrode surrounding said first electrode and relative to the first electrode, the third electrode being positioned and charged such that an amount of electricity with which said thin-layer chromatographic element is charged during its passage through the hydrogen flame is made to become as small as possible;

an amplifier for detecting and amplifying an electric current which is generated at said first electrode by exposure thereof to the ionized gas; and

a recorder connected to said amplifier for recording an output obtained from said amplifier as a chromatogram.

4,965,049

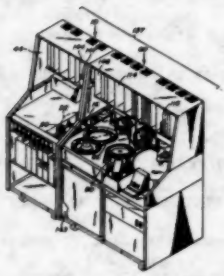
MODULAR ANALYZER SYSTEM

John E. Lillig, Diamond Bar; Michael J. Whelan, Anaheim Hills; Thomas V. Cheon, Costa Mesa; Patricia A. Sisson, Santa Ana, and Orlando Flores, Anaheim, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 884,464, Jul. 11, 1986, abandoned. This application May 22, 1989, Ser. No. 355,799

Int. Cl.[5] B65B *43/42*; G01N *35/02, 35/06*

U.S. Cl. 422—68.1 **13 Claims**



1. In a clinical chemistry analyzer system, comprising:

a first modular analyzer including a sample carousel adapted to receive a plurality of samples, analyzing means for analyzing the samples and automated probe means for transferring samples from the sample carousel to the analyzing means;

a second modular analyzer including a second sample carousel adapted to receive a plurality of samples, an analyzing means in the second modular analyzer different from the analyzing means of the first modular analyzer for analyzing samples, and a second automated probe means for transferring samples from the second sample carousel to the analyzing means of the second modular analyzer, the improvement being:

indexing and joining means for selectively precisely joining the first modular analyzer to the second modular analyzer and indexing the first modular analyzer to the second modular analyzer and indexing the first modular analyzer automated probe means with respect to the second modular analyzer sample carousel, and control means for synchronizing and controlling the first modular analyzer automated probe means and the second modular analyzer sample carousel such that the first modular analyzer automated probe means accesses samples received in and carried by the second modular analyzer sample carousel, the first automated probe means selectively transferring the accessed samples to the analyzing means of the first modular analyzer whereby the first independent modular analyzer and second independent modular analyzer selectively constitutes a single interdependent system.

4,965,050

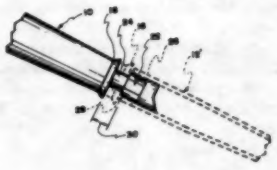
ADAPTATION OF PIPETTER

Paul M. Jessop, Salt Lake City, Utah, assignor to Ballard Medical Products, Midvale, Utah

Filed Jan. 18, 1989, Ser. No. 299,708

Int. Cl.[5] B01L *3/02*

U.S. Cl. 422—100 **9 Claims**



1. A method of adapting a custom pipetter, designed to be used with a custom disposable pipette tip having predetermined dimensional characteristics, for use with a disposable standard pipette tip having a dimensionally shorter proximal section comprising the steps of:

providing the custom pipetter having an actuator, a distal fitting for releasibly and sealingly receiving a custom pipette tip and a distal ejector for ejecting the custom pipette tip from the distal fitting, the distal fitting and the ejector being spaced when at rest by a predetermined distance which prohibits ejection of a standard pipette tip;

providing an adapter for the pipetter;

connecting the adapter to the ejector prior to pipetter use to in effect shorten the predetermined distance by a known amount;

placing a disposable standard pipette tip upon the distal fitting in lieu of such placement of a custom pipette tip;

transferring liquid specimen from one location to another using the standard pipette tip and the pipetter;

thereafter selectively displacing

of the actuator of the pipetter to cause the adapter to contiguously engage, displace and eject the disposable standard pipette tip.

2. A pipetter device comprising in combination:

a pipetter comprising actuator means, distal fitting means and distal first pipette tip ejector means spaced proximally of the distal fitting means by a first predetermined distance when the actuator means are at rest, the distal first pipette tip ejector means being relatively displaceable a distance short of the distal fitting means responsive to displacement of the actuator means;

adapter means comprising second pipette tip ejector means and means by which the adapter means are selectively releasibly connected to the first ejector means so that the

second pipette tip ejector means is spaced proximally of the distal fitting means by a second lesser predetermined distance whereby a pipette tip, having a proximal region dimensionally shorter than that with which the pipetter is capable of functioning without the adapter means, placed upon the distal fitting means will, in conjunction with the pipetter, accommodate transfer of a liquid specimen and thereafter will be ejected from the distal fitting means by contiguous contact by the second ejector means due to relative displacement of the adapter means responsive to manual displacement of the actuator means.

4,965,051

REACTOR PROVIDED WITH FLUIDIZED CHAMBER

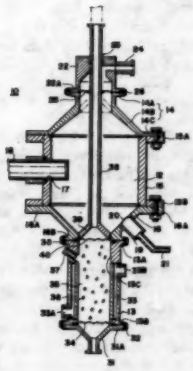
Yukitaka Shukunobe, Kawagoe; Tetsuo Nakamura, Iruma; Tomoe Yoshida, Tokorozawa; Ryoichi Doki, Sayama; Mamoru Kuwazaru, Kawagoe, and Kouzou Shimoda, Tokyo, all of Japan, assignors to R&D Association for Bioreactor System, Tokyo, Japan

Filed Mar. 6, 1989, Ser. No. 319,246

Claims priority, application Japan, Mar. 9, 1988, 63-55756

Int. Cl.[5] B01J *8/02, 8/20*

U.S. Cl. 422—145 3 Claims



1. A reactor for containing a bed of reactive solids and provided with a fluidized chamber for periodic treatment of the reactive solids, comprising:

(1) a generally vertically-disposed column chamber for containing the reactive solids;

(2) a first screen disposed near a lower end of the column chamber for supporting and containing the reactive solids;

(3) a fluidized chamber of greater volume than said column chamber and being disposed generally above and in fluid communication with said column chamber at a fluid communication juncture therebetween;

(4) a straight hollow interior inner tube extending from an upper portion of the fluidized chamber to near said juncture and terminating in a head portion, and wherein the head portion is contactable with the juncture to fluidly seal the column chamber from the fluidized chamber;

(5) a head opening in said head portion in fluid communication with the hollow interior of said inner tube;

(6) a second screen disposed over said head opening so that the reactive solids are containable in said column chamber between vertical inner walls of the column chamber and said first and second screens;

(7) means for allowing movement of said inner tube vertically upwardly until said head portion is contactable with an inner wall of the upper portion of said fluidized chamber at a contact point, so as to fluidly seal the upper portion of the fluidized chamber from a lower portion of the fluidized chamber;

(8) a first fluid gateway disposed in said fluidized chamber and in a portion thereof above said contact point;

(9) a third screen disposed between said contact point and said first fluid gateway;

(10) means for introducing a washing fluid or the like into a bottom portion of the column chamber such as to move the reactive solids disposed therein from said column chamber and fluidize the solids in the fluidized chamber; and wherein said fluidized chamber has a configuration such that when said washing fluid is discontinued, the reactive solids settle into said column chamber and are again retainable therein by movement of said head portion to said juncture; and

(11) means for introducing a washing liquid through the first gateway and passing the washing liquid out of a second gateway disposed in said fluidized chamber and having a screen thereon when said head portion is disposed at said juncture;

whereby, the reactive solids may be washed in said fluidized chamber while the column chamber is being simultaneously washed with separate wash water or the fluidized chamber may be washed while reactive solids in the column chamber are reacting with a reactable solution.

4,965,052

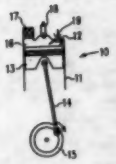
INTEGRATED PRODUCT GENERATION AND CATALYTIC PRODUCT SYNTHESIS IN AN ENGINE-REACTOR

Frank E. Lowther, Plano, and William M. Bohon, Carrollton, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 3, 1987, Ser. No. 116,191

Int. Cl.[5] F02B *65/00*

U.S. Cl. 422—187 6 Claims



1. An integrated engine-reactor for converting a reactant and an oxidizer to an end product comprising:

a first chamber therein, said first chamber comprises a cylinder in said engine-reactor having a reciprocating piston therein and a cylinder head thereon;

means for igniting said reactant and oxidizer in said first chamber to produce an initial product therein;

a second chamber in fluid communication with said first chamber to receive said initial product therefrom, said second chamber adapted to be filled with a catalytic material which upon contact with said initial product will catalytically synthesize said end product;

a third chamber in fluid communication with said second chamber adapted to receive said end product wherein said end product expands to thereby cool said end product; and

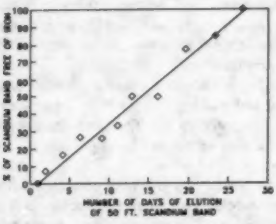
means to exhaust said expanded end product from said engine-reactor.

4,965,053

ION EXCHANGE PURIFICATION OF SCANDIUM

Laurie A. Herchenroeder, Noblesville, Ind., and Harvey R. Burkholder, Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Feb. 10, 1989, Ser. No. 310,044
Int. Cl.[5] C01F 17/00; C22B 59/00
U.S. Cl. 423—21.5 13 Claims



1. A method of ion exchange purification of scandium comprising:

contacting a solution containing scandium with a cation exchange resin;

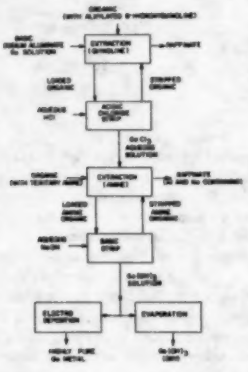
eluting said scandium with a solution comprising up to 5.0 grams per liter of HEDTA which may have potentially interfering metallic cations, and to which is added a small but metallic cation oxidation potential increasing effective amount of a compound selected from the group consisting essentially of potassium chlorate and ammonium chloride, at a temperature of from about 80° C. to about 95° C. and a pH of from about 7.4 to about 7.9; and contacting a dilute solution of scandium with said resin.

4,965,054

PROCESS OF EXTRACTION OF GALLIUM FROM AQUEOUS SOLUTIONS THEREOF

Roy G. Lewis, Tucson, Ariz., assignor to Henkel Corporation, Ambler, Pa.

Filed Aug. 1, 1989, Ser. No. 388,261
Int. Cl.[5] C01G 15/00
U.S. Cl. 423—112 20 Claims



1. A process for the recovery of gallium from an aqueous solution thereof comprising:

(a) contacting the gallium containing aqueous solution with a solution of a water insoluble hydroxyquinoline compound in a water insoluble and immiscible organic solvent for a sufficient time to extract and transfer said gallium values from said aqueous solution forming two phases, an organic phase (I) containing said gallium values and an aqueous phase (II) now barren of gallium;

(b) separating the immiscible organic phase (I) from said aqueous phase (II);

(c) contacting the organic phase (I) with an acidic aqueous solution whereby said gallium values are removed or extracted from said organic phase (I) into said aqueous acidic solution;

(d) separating said organic phase (I) now barren of gallium from said aqueous acidic uolution phase (III);

(e) contacting said aqueous phase (III) with a solution of a water insoluble amine compound in a water insoluble and immiscible organic solvent for a sufficient time to extract said gallium values from said aqueous phase (III), forming an organic phase (IV) now containing said gallium values and an aqueous phase (V) now barren of gallium;

(f) separating said organic phase (IV) from said aqueous phase (V); and

(g) contacting said organic phase (IV) with an aqueous alkaline solution to remove and extract said gallium from said organic phase (IV) into said aqueous alkaline solution forming aqueous phase (VI) now containing said gallium values;

(h) separating said aqueous phase (VI) from said organic phase (IV) now barren of said gallium values and

(i) recovering said gallium values from said aqueous alkaline solution phase (VI).

4,965,055

PREPARATION OF ULTRA-PURE METAL HALIDES

Paul E. R. Nordquist, Jr., and Arnold H. Singer, both of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 27, 1990, Ser. No. 499,843
Int. Cl.[5] C01B 9/00, 9/08; C01G 1/00
U.S. Cl. 423—492 20 Claims

1. A method for removing a group VIA, VIIA, VIIIA, IB or IIB metal impurity from a halide of a group IVA or VA metal, comprising the steps of:

preparing a solution comprising the halide of the metal to be purified, an amount of a complexing agent sufficient to form a first charged complex with any of said group IVA or VA metal, and a ligand which forms a second charged complex with said metal impurity in an amount sufficient to complex with essentially all of the metal impurity to be removed, said second charged complex having a charge opposite that of said first charged complex; and

passing said solution containing said first charged complex and said second charged complex through an ion exchange column, bearing charged groups which retain said second charged group upon said column, whereby said second charged complex binds to said column and said first charged complex passes freely through said column.

4,965,056

METHODS FOR PREPARING LEAD LANTHANUM ZIRCONATETITANATE POWDERS WITH CARBONATE PROCESSES

Yen-Hwei Chang, Tainan, Taiwan, assignor to Ming-Chin Wu, Kaohsiung, Taiwan

Continuation-in-part of Ser. No. 184,597, Apr. 21, 1988, abandoned. This application Apr. 11, 1990, Ser. No. 507,474
Int. Cl.[5] C01F 17/00
U.S. Cl. 423—263 2 Claims

1. A method of preparing PLZT powder using an adsorptive carbonate process, consisting essentially of the steps of:

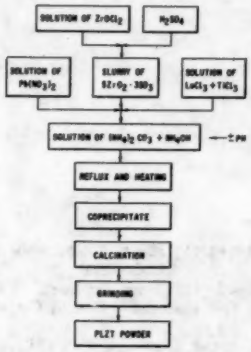
(a) adding a solution of zirconium oxychloride to sulfuric acid to obtain a precipitate of $(5ZrO_2).(3SO_3)$;

(b) blending together respective solutions of $Pb(NO_3)_2$, chlorides of La and Ti, and a slurry of said $(5ZrO_2).(3SO_3)$ precipitate to form a blended mixture;

(c) combining said blended mixture with a solution consisting of NH_4OH and $(NH_4)_2CO_3$;

(d) refluxing the combination of step (c) at a temperature in the range of 40° C. to 100° C. and a pH value in the range of 6 to 12 for a period of about 1 to 6 hours to coprecipitate a majority of particles of $(2ZrO_2).(CO_2)$ forming nuclei covered by the carbonates of La, Ti and Pb, and a minority of particles of $(2ZrO_2).(CO_2)$ forming nuclei covered by the hydroxides of La, Ti and Pb, and;

(e) drying the coprecipitates by heating to obtain amorphous PLZT powder.



4,965,057

PROCESS FOR PRODUCING MORPHOLOGICALLY IMPROVED CERIC OXIDE PARTICULATES

Claire David, Paris, and Francoise Seon, Montreuil, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jun. 27, 1988, Ser. No. 211,896
Claims priority, application France, Jun. 26, 1987, 87 09020
Int. Cl.[5] C01F *17/00*
U.S. Cl. 423—263 **36 Claims**

1. A process for the preparation of ceric oxide particulates, comprising the steps of (i) hydrolyzing an aqueous solution of a cerium (IV) salt in an acid hydrolysis medium, (ii) adding an aqueous sol comprising an aqueous colloidal dispersion of a cerium (IV) compound to the product of step (i); (iii) separating the precipitate from step (ii); and then (iv) heat treating said precipitate.

4,965,058

POLYSILOXAZANES, SILICON OXYNITRIDE FIBERS AND PROCESSES FOR PRODUCING SAME

Osamu Funayama; Mikiro Arai; Hayato Nishii, all of Saitama, and Takeshi Isoda, Niiza, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 13,680, Feb. 12, 1987, Pat. No. 4,869,858. This application Jul. 19, 1989, Ser. No. 382,713
Claims priority, application Japan, Feb. 12, 1986, 61-026881
Int. Cl.[5] C01B *33/20, 15/14*
U.S. Cl. 423—325 **3 Claims**

1. Polysiloxazanes comprising copolymers having $-(SiH_2)_nNH-$ and $-(SiH_2)_mO-$ as the main repeating units where each of n and m has a value of 1, 2 or 3, containing at least 1 mole % of repeating unit and having an average

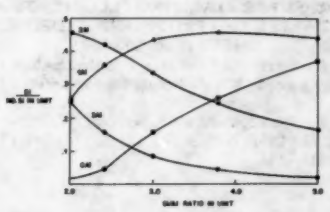
polymerization degree based on repeating units of 9.4 to 300, wherein the copolymers have a linear sequence or cyclic sequence.

4,965,059

HIGH SILICA FAUJASITE ALUMINOSILICATE, ECR-4, AND A PROCESS FOR MAKING IT

David E. W. Vaughan, Flemington, N.J., assignor to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 118,326, Nov. 6, 1987, abandoned, which is a continuation-in-part of Ser. No. 606,940, May 4, 1984, Pat. No. 4,714,601. This application Jun. 30, 1989, Ser. No. 356,472
The portion of the term of this patent subsequent to Dec. 22, 2004, has been disclaimed.
Int. Cl.[5] C01B *33/28*
U.S. Cl. 423—328 **12 Claims**



1. An aluminosilicate characterized by having a faujasite structure with super cages and having the x-ray diffraction pattern

d Spacing (Å)	Relative Intensity
14.05–14.20	VS
8.60–8.70	M
7.32–7.44	W
7.00–7.15	W
5.58–5.65	S
4.68–4.75	M
4.30–4.35	M
3.85–3.90	W
3.70–3.75	M–S
3.40–3.45	W
3.25–3.30	M
2.97–3.05	W
2.87–2.90	M–W
2.81–2.84	M
2.72–2.75	W
2.59–2.63	W
2.34–2.37	W

where VS=100-80; S=80-40; M=40-15; W=3-15 in absolute value ranges, a silica to alumina mole ratio of greater than six, and the presence of an unbalanced organic ammonium template $R_1R_2R_3R_4N+$ selected from the group where R_1 and R_2 are alkyl or hydroxyl alkyl groups having carbon numbers ranging separately from 1 to 4, and R_3 and R_4 are alkyl groups having carbon numbers ranging from 3 to 4 or hydroxy alkyl

groups having carbon numbers ranging separately from 2 to 4, wherein said organic ammonium templates are within the super cages of said aluminosilicate.

4,965,060

PROCESS FOR PRODUCING HYDROGEN CYANIDE AND APPARTUS FOR USE IN THE PROCESS

Kengo Tsukahara; Takeshi Otake, both of Niigata; Masao Saito, Yachiyo, and Toshio Koseki, Abiko, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Apr. 13, 1989, Ser. No. 337,404
Claims priority, application Japan, Apr. 13, 1988, 63-89305
Int. Cl.[5] C01C *3/02*
U.S. Cl. 423—376 **3 Claims**

1. A process for producing hydrogen cyanide which comprises reacting methane or a gas containing methane as a main component, ammonia and an oxygen-containing gas in the presence of a platinum-containing catalyst, wherein the reaction gases are quenched by using an indirect heat-exchanger without quenching them directly with water, said indirect heat exchanger being made of a nickel alloy which consists of

(a) 60 to 80% by weight of nickel,
(b) 5 to 25% by weight of chromium,
(c) 0 to 3% by weight of iron, and
(d) 0 to 25% by weight of another metal,

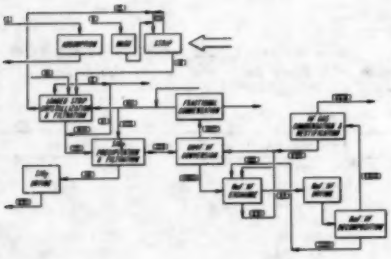
the total amount of the components (a), (b), (c) and (d) being 100% by weight.

4,965,061

PROCESS FOR REMOVING FLUORIDE FROM A WASTEWATER AND PRODUCING HYDROFLUORIC ACID THEREFROM

William W. Berry, and Gordon J. Rossiter, both of Lakeland, Fla., assignors to Florida Recoveries Partnership, Lakeland, Fla.

Filed Jan. 30, 1989, Ser. No. 302,979
Int. Cl.[5] C01B *7/19, 33/10;* C01C *1/16;* C01D *3/02*
U.S. Cl. 423—484 **6 Claims**



1. A process for producing hydrofluoric acid from SiF_6^{2-} comprising the steps of:

(i) combining $(NH_4)_2SO_4$, at a pH high enough such that the sulfate is in a non-protonated state, with SiF_6^{2-} from said wastewater in an amount in excess of that stoichiometrically required to form $(NH_4)_2SiF_6$ as follows:

$$(NH_4)_2SO_4+SiF_6^{2-}\rightarrow(NH_4)_2SiF_6+SO_4^{2-}$$

(ii) concentrating a solution including $(NH_4)_2SiF_6$ and excess $(NH_4)_2SO_4$ to precipitate separate $(NH_4)_2SiF_6$ therefrom, wherein the separated $(NH_4)_2SiF_6$ has a higher purity than if stoichiometric ratios of the reactants had been used.

(iii) re-solubilizing the $(NH_4)_2SiF_6$ for reaction with NH_4OH to form NH_4F liquor and precipitated $Si(OH)_4$;

(iv) separating the NH_4F liquor from the precipitated $Si(OH)_4$;

(v) reacting the NH_4F with water to form precipitated $NH_4F.HF$ and ammonia gas;

(vi) reacting $NH_4F.HF$ with NaF to yield precipitated NaF.HF and NH_4F liquor; and

(vii) heating and decomposing the NaF.HF into HF and NaF.

4,965,062

HYDROGEN SULFIDE REMOVAL AND SULFIDE RECOVERY

Christiaan P. Van Dijk, Houston, and Lowell D. Fraley, Sugarland, both of Tex., assignors to Brudike Corporation, Houston, Tex.

Filed Oct. 4, 1988, Ser. No. 253,176
Int. Cl.[5] C01B *17/05;* B01D *5/00*
U.S. Cl. 423—576.7 **21 Claims**

1. A process which comprises:

contacting a gas stream containing hydrogen sulfide with an aqueous stream containing an acid-acid salt buffering system and less than a stoichiometric amount of sulfite ions to produce an effluent gas stream containing residual H_2S and an effluent aqueous stream containing liquid sulfur; and

extracting residual H_2S from the effluent gas stream, and oxidizing residual H_2S to produce sulfur dioxide.

4,965,063

CLEANER AND DISINFECTANT WITH DYE

Irene Casey, P.O. Box No. 90566, Houston, Tex. 75269-0566, and Helmut L. Melzer, 2600 Galicia Way, La Costa, Calif. 92009

Continuation-in-part of Ser. No. 936,171, Dec. 1, 1986, Pat. No. 4,793,988, which is a continuation-in-part of Ser. No. 738,082, May 24, 1985, abandoned. This application Aug. 2, 1988, Ser. No. 227,178
The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.
Int. Cl.[5] A61K *9/12*
U.S. Cl. 424—7.1 **7 Claims**

1. A composition for cleaning a surface comprising:

at least one surfactant;

a pH sensitive dye which changes color upon exposure to air;

an alkali means for adjusting the pH of the composition to an alkali pH to produce a color in the composition so that upon neutralization in the air the dye loses color;

a propellant system for foaming the composition;

said composition being a visually colored foam composition with the disappearing pH sensitive dye effectively indicating the delivery of the foam and giving a visual check as to the area contacted when the visually colored foam is applied; and

said composition is packaged sealed airtight in a container adapted for propellant foam delivery of the composition.

4,965,064

PHEOPHORBIDE DERIVATIVES

Michito Karasawa, Settsu; Mari Uchimoto, Higashiosaka; Hirofumi Kawabe, Tokyo; Takuzo Otani, Sakai, and Katsuo Aizawa, Yokohama, all of Japan, assignors to Hamari Chemicals, Ltd., Osaka, Japan

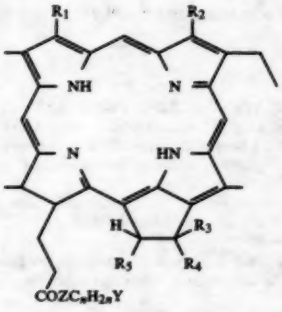
Filed Dec. 15, 1988, Ser. No. 285,106

Claims priority, application Japan, Dec. 21, 1987, 62-325083; Mar. 28, 1988, 63-75291

Int. Cl.[5] C07D *257/00*; A61K *31/40, 49/00*

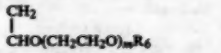
U.S. Cl. 424—9 4 Claims

1. A pheophorbide derivative of the general formula:



wherein Z is O or NH; n is an integer of 1 to 6; Y is NR'R" or

wherein R', R" and R"' are the same or different or each represents a C_1 to C_4 lower alkyl group; X^- is a halogen or organic acid ion; R_1 is an ethenyl group, C_1 to C_4 lower alkyl group or



wherein m is an integer of 0 to 6; R_6 is H or a C_1 to C_4 lower alkyl group; R_2 is CH_3, CHO or CH_2OH; either of R_3 and R_4 is H, with the other being OH, or both of them combine to represent =O; R_5 is H or CO_2CH_3.

4,965,065

GASTROPROTECTIVE PROCESS AND COMPOSITIONS

Alison B. Lukacsko, Robbinsville, and Randy J. Koslo, East Windsor, both of N.J., assignors to Bristol-Myers Squibb Company, New York, N.Y.

Continuation-in-part of Ser. No. 858,542, Apr. 29, 1986, abandoned, which is a continuation of Ser. No. 836,263, Mar. 4, 1986, abandoned. This application Feb. 6, 1987, Ser. No. 11,792

Int. Cl.[5] A61K *31/615, 31/60, 31/225*

U.S. Cl. 424—10 30 Claims

1. A pharmaceutical composition for oral administration having reduced potential for NSAID-induced gastrointestinal injury comprising a therapeutically effective amount of NSAID and a protective quantity of a beta adrenergic agonist component selected from the group consisting of isoproterenol, metaproterenol, terbutaline, albuterol, fenoterol, bitolterol, isoetharine, colterol, ritodrine, and their pharmaceutically acceptable salts.

4,965,066

INTRANASAL ADMINISTRATION OF 3,3-DISUBSTITUTED INDOLINES

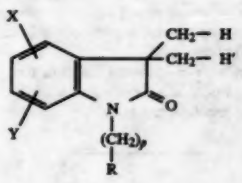
Munir A. Hussain, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 6, 1989, Ser. No. 362,284

Int. Cl.[5] A61K *9/12, 31/175*

U.S. Cl. 424—45 25 Claims

1. A pharmaceutical composition in the form of nasal spray, nasal drops, nasal ointment, nasal gel or an aerosol comprising a suitable intranasal pharmaceutical carrier which is isotonic with nasal secretions and a compound present in an amount to deliver to a mammal about 0.1 mg/kg to 30 mg/kg, said compound having the formula:



(I)

wherein:

p is 0 or 1;

Z is O or S;

R is C_1–C_{10} alkyl, C_3–C_8 cycloalkyl, 2-pyridyl, 3-pyridyl, 4-pyridyl or

V, W, X, and Y independently are H, halo, C_1–C_3 alkyl, OR^1, NO_2, CF_3, CN or NR^2R^2, R^1 and R^2 independently are H or C_1–C_3 alkyl; — H and — H' independently are 6-membered heterocyclic aromatic rings containing at least one nitrogen atom as a part of the ring optionally substituted with one substituent selected from the group C_1–C_3 alkyl, halo, OR^1, or NR^1R^2; or

an oxide or pharmaceutically suitable acid addition salt thereof.

4,965,067

ORAL COMPOSITIONS

John R. Wietfeldt, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 10, 1988, Ser. No. 230,553

The portion of the term of this patent subsequent to Apr. 28, 2005, has been disclaimed.

Int. Cl.[5] A61K *7/18*

U.S. Cl. 424—52 7 Claims

1. An oral composition in the form of a toothpaste comprising:

(a) a safe and effective amount of a copolymer of vinyl methyl ether and maleic anhydride;

(b) a safe and effective amount of a soluble strontium ion source; and

(c) a safe and effective amount of a soluble fluoride ion source;

wherein said composition is substantially free of linear, noncrosslinked acrylic acid polymers or copolymers.

4,965,068

POLYVALENT HYPERIMMUNOGLOBULIN PREPARATION

Wolfgang Stephan, Dreieich; Herbert Dichtelmuller, Sulzbach, and Michael Kloft, Darmstadt, all of Fed. Rep. of Germany, assignors to Biotest Pharma GmbH, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 124,334, Nov. 19, 1987, abandoned, which is a continuation of Ser. No. 859,840, May 5, 1986, abandoned. This application Jun. 23, 1989, Ser. No. 370,118
Claims priority, application Fed. Rep. of Germany, May 4, 1985, 3516119
Int. Cl.[5] A61K *39/40*
U.S. Cl. 424—87 21 Claims

1. A process for making a human polyvalent hyperimmunoglobulin preparation having activities against gram-negative as well as against gram-positive bacteria and comprising the steps of:

(a) screening plasma, serum or whole blood from human donors for a titer of antibody to *E. coli* J5 antigen of at least 1:160 by means of passive hemagglutination test,

(b) pooling the donor plasma, serum or whole blood according to step (a) above, and

(c) preparing an immunoglobulin fraction from the plasma serum or blood pooled according to step (b) by means of the Cohn fractionation method.

4,965,069

OXIDIZED VIRUSES OR VIRAL ANTIGENS AND UTILIZATION FOR DIAGNOSTIC PROPHYLACTIC AND/OR THERAPEUTIC APPLICATIONS

Gerard A. Quash, 12 Alle'des Charmilles, Franche Ville, France 69340; John D. Rodwell, 430 Ramsey Rd., Yardley, Pa. 19067; Thomas J. McKearn, R.D. #3, Box 119, New Hope, Pa. 18938, and Jean P. Ripoll, 12 rue Freres Rizier, Cassieu, France

Continuation-in-part of Ser. No. 928,631, Nov. 18, 1986, Pat. No. 4,853,326. This application May 20, 1987, Ser. No. 52,518
Int. Cl.[5] A61K *39/12*
U.S. Cl. 424—89 14 Claims

1. A method for protection of an animal or a human from an infection induced by a virus, comprising: administering to an animal or human an effective amount of a vaccine formulation which comprises a virus, viral antigen or fragment thereof having an oxidized oligosaccharide moiety which elicits a protective immune response, in which the oligosaccharide moiety was obtained by oxidation, by means of an agent selected from the group consisting of periodic acid, salts thereof, paraperiodic acid, salts thereof, metaperiodic acid, salts thereof and oxidase enzymes, of an oligosaccharide moiety of a virus, viral antigen or fragment thereof.

4,965,070

DEER REPELLENT FORMULATION

James J. Messina, Cooper La., Chester, N.J. 07930

Continuation-in-part of Ser. No. 215,982, Jul. 7, 1988, abandoned. This application Sep. 14, 1989, Ser. No. 407,271
Int. Cl.[5] A01N *25/24, 63/00, 65/00*
U.S. Cl. 424—581 3 Claims

1. A deer repellent formulation consisting essentially of by volume:

68 to 90% water
6 to 10% thiram
0.5 to 2% chicken eggs
1 to 2% liquid hot sauce
0.5 to 2% coloring dye; and
2 to 16% adhesive.

4,965,071

WRINKLE MASKING COMPOSITION OF SODIUM POLYSTYRENE SULFONATE AND PROCESS FOR USE

Antoine Kawan, Washington, D.C., assignor to The Gillette Company, Boston, Mass.

Filed Oct. 19, 1988, Ser. No. 259,713
Int. Cl.[5] A61K *7/02*
U.S. Cl. 424—401 49 Claims

1. A wrinkle masking composition comprising:

(a) a film forming water soluble polymer comprising sodium polystyrene sulfonate compatible with skin, which forms a basic matrix holding together said composition over skin and having adhesive properties to skin;

(b) a plasticizer for said polymeric matrix,

(c) a biopolymeric modifier which imparts skin-like character, skin compatibility and flexibility to said composition, and

(d) a filler comprising aluminosilicate.

4,965,072

GRANULATING COMPOSITION AND METHOD

Thomas A. Alexander, South Bend; Lawrence J. Daher, Elkhart, both of Ind.; Clarence L. Hancock, Edwardsburg, Mich., and Donald L. Peterson, Elkhart, Ind., assignors to Miles Inc., Elkhart, Ind.

Filed Nov. 3, 1988, Ser. No. 266,649
Int. Cl.[5] A61K *9/26, 9/46*
U.S. Cl. 424—458 7 Claims

1. A granulating composition comprising magnesium sulfate and sodium hexametaphosphate in an aqueous solution.

4,965,073

PROCESS FOR PREPARING THE PRINTED-CIRCUIT BOARDS USING A PHOTOSENSITIVE COMPOSITION CONTAINING A REDUCTION TYPE LEICO PIGMENT

Tsutomu Maruyama; Kiyotake Fukawa; Atsushi Akiyama, and Yoshihiro Kiyomura, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Amagasaki, Japan

Filed Mar. 21, 1990, Ser. No. 496,932
Claims priority, application Japan, Mar. 23, 1989, 1-71058
Int. Cl.[5] G03C *5/00*
U.S. Cl. 430—292 5 Claims

1. An improved process for preparing the printed circuit board, which comprises coating a photo-curable electrodeposition coating composition on the surface of the copper foil of a copper-clad, laminated plate to form a photo-sensitive resist film thereon, lapping a photographic negative or positive film onto the photo-sensitive resist film, and exposing to an active light, followed by development, the improvement comprising incorporating a colorless or substantially colorless reduction-type leico pigment into the electrodeposition coating composition to form a photo-sensitive resist film containing the leico pigment, and to develop a color in an exposed area of the photo-sensitive resist film by exposing to the active light.

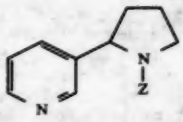
4,965,074

METHOD OF TREATING MEMORY IMPAIRMENT

Lewis J. Leeson, Roseland, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 51,781, May 20, 1987, Pat. No. 4,765,985, which is a division of Ser. No. 708,466, Mar. 5, 1985, Pat. No. 4,680,172. This application Aug. 15, 1988, Ser. No. 232,266
Int. Cl.[5] A61K *9/00, 9/70, 31/465;* A61F *13/00*
U.S. Cl. 424—449 13 Claims

1. A method of treating memory impairment comprising administering to a patient in need thereof an effective amount of a compound of the formula



(A)

wherein Z represents H or lower alkyl transdermally.

4,965,075

METHODS OF INCREASING 1-SERIES PGS IN THE BODY

David F. Horrobin, Surrey, England; Stephen C. Cunnane, and Mehar S. Manku, both of Nova Scotia, Canada, assignors to Efamol Limited, Guildford, England

Continuation of Ser. No. 783,601, Oct. 3, 1985, abandoned. This application Nov. 21, 1988, Ser. No. 273,680

Claims priority, application United Kingdom, Oct. 3, 1984, 8425006

Int. Cl.[5] A61K *33/34, 31/20*

U.S. Cl. 424—638 2 Claims

1. A method of influencing the 1-series/2-series PG balance in the body to increase the proportion of 1-series PGs, comprising administering to a person in need thereof a therapeutically effective quantity of a pharmaceutical composition comprising:

(1) gamma-linolenic acid, dihomo-gamma-linolenic acid or a mixture of the two, present as such or as a derivative convertible in the body thereto, in an amount of from 0.2 to 10 grams, calculated as gamma-linolenic acid;

(2) from 0.1 to 100 mg, calculated as copper, of at least one assimilable copper compound; and, optionally

(3) a pharmaceutically acceptable carrier or diluent.

4,965,076

SHELF STABLE COOKIE

August J. Martin, Aurora, Colo., and Raymond Mooi, Wyoming, Mich., assignors to Keebler Company, Elmhurst, Ill.

Continuation of Ser. No. 518,807, Jul. 29, 1983, abandoned. This application Mar. 30, 1987, Ser. No. 32,946

The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.

Int. Cl.[5] A21D *10/00, 8/04, 6/00;* A23L *1/105*

U.S. Cl. 426—18 42 Claims

1. A laminated dough preform comprising:

first and second unbaked premixed dough layers containing dough ingredients including sucrose which, when baked, result in a substantially crumb continuous laminate over its cross section;

said ingredients in said first premixed dough layer permitting said sucrose in said layer to readily crystallize when the laminated dough preform is baked such that said ingredients in said first layer produce a substantially crisp texture; and

said second premixed dough layer containing a second sugar which is a crystallization resistant sugar, and also containing an enzyme which is active upon at least one of said dough ingredients in said second layer to produce in situ a sugar product in said second layer from said dough ingredient at least by completion of bake which, together with said second sugar, is sufficient to substantially prevent the recrystallization of the sucrose in said second layer when said laminated dough preform is baked and reaches textural equilibrium such that said second layer has a shelf stable, substantially chewy texture relative to said first layer.

4,965,077

SHELF STABLE COOKIE

August J. Martin, Aurora, Colo., and Thomas E. Furia, San Jose, Calif., assignors to Keebler Company, Elmhurst, Ill.

Continuation of Ser. No. 518,357, Jul. 29, 1983, abandoned. This application Mar. 16, 1987, Ser. No. 27,143

The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.

Int. Cl.[5] A21D *8/04, 10/00, 6/00;* A23L *1/105*

U.S. Cl. 426—18 38 Claims

1. A laminated dough preform comprising:

first and second unbaked premixed dough layers containing dough ingredients including sucrose which, when baked, result in a substantially crumb continuous laminate over its cross section;

said ingredients in said first premixed dough layer permitting said sucrose in said layer to readily crystallize when the laminated dough preform is baked such that said ingredients in said first layer produce a substantially crisp texture; and

said second premixed dough layer also containing an enzyme which is active upon at least one of said dough ingredients in said second dough layer to produce in situ a sugar product in said second layer from said dough ingredient at least by completion of bake which is sufficient to substantially prevent the recrystallization of the sucrose in said second layer when said laminated dough preform is baked and reaches textural equilibrium such that said second layer has a shelf stable, substantially chewy texture relative to said first layer.

4,965,078

PREPARATION OF HARD CHEESE FROM CONCENTRATED MILK

Hendrikus J. Van Leeuwen, Emerald; Norman H. Freeman, Moorabbin; Brian J. Sutherland, Springvale South, and Graeme W. Jameson, Kew, all of Australia, assignors to Commonwealth of Australia, Australia

Continuation of Ser. No. 238,193, Aug. 30, 1988, abandoned, which is a continuation of Ser. No. 72,686, Jul. 13, 1987, abandoned, which is a continuation of Ser. No. 618,403, Jun. 1, 1984, abandoned. This application Apr. 28, 1989, Ser. No. 344,612

Int. Cl.[5] A23C *19/024, 19/04, 19/05*

U.S. Cl. 424—40 20 Claims

1. A process for the manufacture of cheese curd for conversion into a hard cheese, comprising the sequential steps of:

(i) concentrating a milk or a product produced from milk by untraafiltration to produce a retentate having a Concentration Factor in the range of 2–8 and reducing the lactose in the retentate to a level of 1.0–6.2% w/w by diafiltration to produce an ultrafiltered and diafiltered retentate;

(ii) separating the ultrafiltered and diafiltered retentate into a minor portion and a major portion, and fermenting the minor portion of retentate with at least one cheese starter culture to allow a pH drop due to fermentation of 0.2–2.0 pH units in the minor portion of the retentate; mixing the fermented minor portion with the major portion of retentate to give a ripened retentate the pH of which is 0.05–1.0 units lower than that of the original retentate;

(iii) continuously coagulating the ripened retentate with a milk coagulating agent to produce a coagulum;

(iv) cutting the coagulum at a time between 5 and 30 minutes after the addition of the coagulating agent, said cutting being performed in such a manner so that no adverse disruption of the internal structure of the coagulum occurs;

(v) cooking the coagulum by heating to a temperature in the range of 30°–50° C., holding the cooked coagulum at a final cooking temperature until a curd having a composition suitable for conversion into a harad cheese is produced, said cooking operation being performed substantially immediately after cutting and while agitating the

coagulum under conditions that do not cause adverse physical damage to the coagulum but are sufficient to prevent fusion and promote syneresis, the total duration of said combined cooking and agitation operations being in the range of 20–120 minutes; and

(vi) separating the curd from whey expelled during syneresis in stage (v) to provide said cheese curd.

4,965,079

ACIDIFIED MILK PRODUCT OF CREAMY CONSISTENCY AND PROCESS FOR MAKING

Hugh Hose, Yverdon; Tomaso Sozzi, Lausanne, and Robert D. Wood, Lausanne, all of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Filed Oct. 20, 1988, Ser. No. 260,442

Claims priority, application Switzerland, Oct. 6, 1988, 03713/88

Int. Cl.[5] A23C *9/12*

U.S. Cl. 426—43 **17 Claims**

1. A process for providing an acidified milk product of creamy consistency comprising:

preparing an aqueous milk suspension having a dry matter content of 7 to 45% by weight including from 0.03% to 22.5% fats by weight and including at least 6.79% non-fat solids by weight comprising proteins and fermentable sugars;

adjusting the pH of the suspension to a pH of from 6.8 to 7.4; and

fermenting the pH adjusted suspension with a combination of roping *Lactobacillus bulgaricus* and of thickening Streptococcus for from 1.5 hours to 10 hours at a temperature of 30° to 40° C. for obtaining a fermented product having a pH of from 6.2 to 6.5 at a temperature of from 18° C. to 22° C.

4,965,080

PROCESS FOR PRODUCING TOFU-LIKE FOOD

Takeshi Akasaka, Osaka; Kumie Ochi; Kazuhiro Onari; Tsutomu Katayama, both of Hyogo; Hitoshi Furuta; Kazumi Nakae, both of Osaka, and Satomi Fukuda, Hyogo, all of Japan, assignors to Fuji Oil Company Limited, Osaka, Japan

Filed Jan. 31, 1989, Ser. No. 304,098

Int. Cl.[5] A23L *1/052, 1/20*

U.S. Cl. 426—104 **9 Claims**

1. A process for producing tofu-like food which comprises preparing a mixture containing soybean curd, soybean protein, water, and fats and oils and coagulating the mixture by heating, wherein the ratio of crude protein content in the soybean curd to crude protein content in the soybean protein ranges from 0.05 to 1 by weight, wherein said mixture has a pH of from 6.5 to 7.1 and wherein said soybean protein is isolated soybean protein, wherein said heating is a temperature from about 70° to 110° for a period of from about 10 to 60 minutes and wherein the water content of the mixture before coagulation, ranges from 65 to 80% by weight.

4,965,081

DRY MIX SUITABLE FOR THE PREPARATION OF A PUFFABLE FOOD PRODUCT, PROCESSES FOR THE USE THEREOF, AND THE PUFFABLE AND/OR PUFFED FOODS PRODUCTS SO PRODUCED

Charles R. Lazarus, Kitchawan, N.Y., assignor to Haarmann & Reimer Corporation, Springfield, N.J.

Filed Nov. 1, 1988, Ser. No. 265,737

Int. Cl.[5] A21D *10/00*; A23D *1/00*

U.S. Cl. 426—242 **18 Claims**

1. A dry mix suitable for the preparation of a puffable food product comprising:

(a) from 60 to less than 94.5% by weight of a native starch selected from the group consisting of native potato starch, native corn starch, native wheat starch, and mixtures thereof,

(b) from more than 3 to no more than 9% by weight of native tapioca starch,

(c) from 1 to less than 6% by weight of a maltodextrin having a dextrose equivalent of 20 or less,

(d) from more than 1.5 to less than 3% by weight of a modified pregelatinized starch selected from the group consisting of modified pregelatinized grain starch, modified pregelatinized tuber starch, modified pregelatinized root and mixtures thereof,

(e) from 0 to 15% by weight of a flavoring and/or a seasoning ingredient.

4,965,082

METHOD FOR MAKING ALIMENTARY PASTE OR PASTA PRODUCTS WITHOUT THE CONVENTIONAL DRYING STEP

Dhyaneshwar B. Chawan, Liverpool; Carleton G. Merritt, Phoenix, and Edward A. Matuszak, Liverpool, all of N.Y., assignors to Borden, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 195,803, May 19, 1988, abandoned. This application Mar. 15, 1989, Ser. No. 323,880

Int. Cl.[5] A21D *2/00*; A23D *1/00*

U.S. Cl. 426—331 **40 Claims**

1. A process for preparing shaped pieces of alimentary paste which comprises

(a) preparing a mixed feedstock comprising glutinous flour, ethyl alcohol and water, to form an alimentary paste having a total moisture content at or below about 26 weight percent by weight of said feedstock, wherein the amount of the ethyl alcohol in said feedstock is not less than 0.1 weight percent and not more than about 10 percent by weight of said feedstock;

(b) extruding or sheeting said mixed feedstock under pressure, at a temperature within the extruder sufficient to reduce the viscosity of the paste so as to be extrudable or sheetable at a desired pressure, said temperature being one at which the extruded or sheeted alimentary paste has a level of starch gelatinization below 20 weight percent of the total starch content in said extruded or sheeted alimentary paste; and then

(c) forming said extrudate or said sheet into individual pasta pieces.

4,965,083

REMOVAL OF BITTERNESS FROM CITRUS JUICES USING A POST-CROSSLINKED ADSORBENT RESIN

Seth I. Norman; Richard T. Stringfield, both of Midland, Mich., and Christopher C. Gopsill, Wilmslow, England, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 172,059, Mar. 23, 1988. This application Mar. 20, 1989, Ser. No. 326,186

Int. Cl.[5] A23L *2/30, 2/36*

U.S. Cl. 426—422 **35 Claims**

1. A process for removing bitter components from citrus juices which comprises: contacting a citrus juice with an effective amount of an adsorbent resin so as to adsorb the bitter components from said citrus juice onto said adsorbent resin, wherein said adsorbent resin is derived from a copolymer of a monoethylenically unsaturated monomer and a crosslinking monomer, where the copolymer has been post-crosslinked in the swollen state in the presence of Friedel-Crafts catalyst in a swollen state and functionalized with hydrophilic groups.

4,965,084

BEVERAGES UTILIZING A PARTICULATE FILTERAID WITH A POLYDENTATE LIGAND WITH A POLYDENTATE LIGAND

F. Jon Austin, Waupaca, Wis., and Don A. Kubose, Fowler, Calif., assignors to A. Gusmer Inc., Cranford, N.J.

Filed Oct. 2, 1989, Ser. No. 415,643
Int. Cl.[5] C12H *1/04*
U.S. Cl. 426—422 11 Claims

1. A method for reducing the iron content in beverages processed through a particulate filteraid by treating the filteraid prior to use as a filter for beverages by a method comprising contacting a particulate filteraid with a polydentate ligand to provide a treated filteraid, forming said filter aid into filter sheets comprising said filter aid and cellulose pulp and contacting said filter sheets with a beverage so as to form a complex between a substantial amount of beverage soluble iron contained in said beverage with said ligand.

4,965,085

PREPARATION OF A SEASONING

Sven Heyland, Weiningen; Karl Rolli, Winterthur; David Röschli, Pfungen, and Jaak J. Silver, Gutenswil, all of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Continuation-in-part of Ser. No. 168,426, Mar. 15, 1988, Pat. No. 4,879,130. This application Oct. 26, 1989, Ser. No. 417,889
Claims priority, application Switzerland, Apr. 6, 1987, 1317/87
The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.
Int. Cl.[5] A23L *1/231*
U.S. Cl. 426—533 11 Claims

1. A process for preparing a flavoring agent comprising:

mixing ingredients comprising at least a protein hydrolyzate, at least one reducing sugar and water for forming a paste-like mixture, wherein the protein hydrolyzate is in an amount of from 40% to 95% by weight, the at least one reducing sugar is in an amount of from 0.5% to 10% by weight and the water is in an amount such that the water content of the mixture is from about 5% to about 12% by weight, each weight being based upon the weight of the mixture;

kneading and heating the paste-like mixture for plasticizing it;

propelling the plasticized mixture through an extrusion unit under a pressure of from 1 bar to 100 bar while heating the plasticized mixture at a temperature of from 80° C. to 140° C. for from 30 secs to 30 mins for reacting the mixture; and

extruding the reacted mixture through an extrusion die into a chamber having a reduced pressure of from 5 mbar to 50 mbar for drying and cooling the reacted mixture for providing a flavorant.

4,965,086

CHEMICAL-MECHANICAL TREATMENT OF LIGNOCELLULOSICS TO IMPROVE NUTRITIVE VALUE

Oswald Helmling, Wyckoff; G. Arnold, Ringwood, N.J.; H. Rzehak, Ryebrook, N.Y.; George C. Fahey, Jr., Urbana, Ill.; Larry L. Berger, Champaign, Ill.; Neal R. Merchen, Champaign, Ill.; John Medina, Nutley, and Rudi Moerck, Montville, both of N.J., assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 4, 1988, Ser. No. 140,690
Int. Cl.[5] A23K *1/00*
U.S. Cl. 426—636 7 Claims

1. A method for treating lignocellulosic substrates which include lignin containing cell wall components that protect structural polysaccharides from digestion wherein the method improves the nutritive value of the substrate and consists essentially of the steps of:

chemically treating a plant substrate with a sufficient amount of an alkaline material and hydrogen peroxide or a compound which generates hydrogen peroxide, for a sufficient period of time to substantially disrupt the cell wall and substantially delignify non-woody lignocellulostic substrates to thereby obtain a blended mixture having a consistency of at least 20%; and

simultaneously extruding the chemically treated plant substrate, wherein at least part of the chemical treatment occurs during extruding, wherein a product having increased nutrient ability is produced, wherein essentially all the polysaccharide up to about 80% is being made available for ruminal digestion and wherein the blended mixture has a consistency of at least 20%.

4,965,087

METHOD OF MAKING A SENSOR ELEMENT FOR FLUORESCENCE-OPTICAL MEASUREMENTS

Otto Wolfbeis; Herbert Kroneis, and Helmut Offenbacher, all of Graz, Austria, assignors to AVL AG, Schaffhausen, Switzerland

Division of Ser. No. 876,667, Jun. 20, 1986, abandoned, which is a continuation of Ser. No. 558,342, Dec. 5, 1983, abandoned. This application Mar. 23, 1988, Ser. No. 172,959
Claims priority, application Austria, Dec. 7, 1982, 4459/82; Nov. 17, 1983, 4047/83
Int. Cl.[5] G01N *21/64, 31/22;* B05D *1/36*
U.S. Cl. 427—2 1 Claim

1. A method of providing a sensor element which is useful in making fluorescence-optical measurements of the pH value of a physiological sample having an ionic strength, the sensor element having a high mechanical stability and a reduced susceptibility to the influence of the ionic strength of such a physiological sample, said method comprising the steps of

(1) providing a transparent carrier plate which is made of glass and has opposite surfaces,

(2) distributing microporous glass particles on one of said opposite surfaces of said transparent carrier plate and heating to a temperature of about 720° to 800° C. to partially embed the microporous glass particles in a uniform distribution in said surface of said transparent carrier plate so as to leave projecting portions which extend outwardly from said one surface of said transparent carrier plate, the projecting portions of said microporous glass particles providing a microporous layer on said one surface of said transparent carrier plate,

(3) contacting the projecting surfaces of said microporous glass particles with an acid selected from the group consisting of sulphuric and nitric acid to activate the projecting surfaces,

(4) chemically bonding a fluorescent indicator substance to the activated projecting portions of said microporous glass particles so as to become immobilized with respect to said carrier plate, and

(5) chemically bonding first and second protective substances to the projecting portions of said microporous glass particles so as to become immobilized with respect to said carrier plate, said first protective substance including ionic groups which reduce the influence of the ionic strength of a physiological sample on said fluorescent indicator substance and said second protective substance including hydrophobic groups which render exposed portions of said transparent carrier plate inert, each of said first and second protective substances preventing unwanted changes in fluorescence of said fluorescent indicator substance due to contact with a physiological sample.

4,965,088

CALCIUM PHOSPHATE-COATED COMPOSITE MATERIAL AND PROCESS FOR PRODUCTION THEREOF

Takayuki Shimamune, Tokyo, and Masashi Hosonuma, Kanagawa, both of Japan, assignors to Permelec Electrode Ltd., Kanagawa, Japan

Division of Ser. No. 109,887, Oct. 19, 1987, Pat. No. 4,847,163.
This application Mar. 31, 1989, Ser. No. 331,327
Claims priority, application Japan, Oct. 17, 1986, 61-247160
Int. Cl.[5] A61F *1/24*
U.S. Cl. 427—2 8 Claims

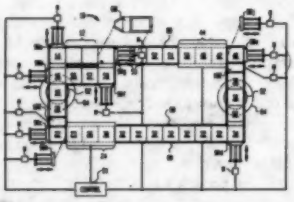
1. A process for producing a calcium phosphate coated-composite material which comprises coating a coating solution containing one or more metals selected from the group consisting of titanium, zirconium, hafnium, vanadium, niobium, tantalum, tin, cobalt, aluminum, chromium, molybdenum and tugsten on the surface of a metallic substrate, converting the one or more metals into a corresponding oxide by heating in a oxidizing atmosphere to form an oxide layer, and then forming a coating of calcium phosphate on the surface of the oxide layer.

4,965,089

METHOD AND APPARATUS FOR THE GELATIN COATING OF CAPLETS

Erich W. Sauter, Washington Crossing; John Hamburg, Fallsington, and Warren L. Phillips, Southampton, all of Pa., assignors to Sauter Manufacturing Corp., Hulmeville, Pa.

Filed Apr. 10, 1989, Ser. No. 336,006
Int. Cl.[5] A61K *9/00*
U.S. Cl. 427—3 11 Claims



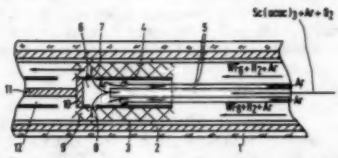
10. A method of coating caplets comprising:
randomly feeding uncoated caplets onto a first surface;
orienting a set of said caplets on said first surface into a two-dimensional array;
moving said set of said caplets into a set of collets with a portion of each said caplet extending from said collets and with said collets arranged as a two-dimensional array on a plate;
dipping the exposed portion of said caplets into a liquid bath to coat said caplets;
drying said caplets to form a dry coating on said caplets;
moving said caplets in said collets to expose an uncoated portion of said caplets;
dipping the uncoated portions of said caplets into a liquid bath to coat said caplets;
drying said caplets to form a dry coating on said caplets; and
moving said caplets out of said collets.

4,965,090

METHOD FOR THE PLASMA-ACTIVATED REACTIVE DEPOSITION OF ELECTRICALLY CONDUCTIVE MULTICOMPONENT MATERIAL FROM A GAS PHASE

Georg F. Gärtner, Aachen; Peter A. Janiel, Würselen, and Hans-Jürgen Lydtin, Stolberg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 4, 1989, Ser. No. 293,168
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1988, 3800712
Int. Cl.[5] C23C *16/08, 16/50, 16/56*
U.S. Cl. 427—39 14 Claims



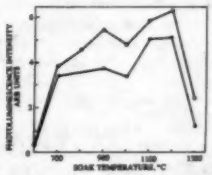
1. A method for the plasma-activated reactive deposition of electrically conductive multicomponent material from a flowing gas phase on a tubular substrate, in which the plasma is produced between an inner electrode and an outer electrode, one of which electrodes is tubular and serves as a substrate, characterized in that the composition of the gas phase is changed as a function of time and/or place and that a periodical reciprocating movement of one of said electrodes is carried out and the stroke of the reciprocating movement is a multiple of the expansion of the deposition profile obtained when the electrodes in relation to each other are in a static condition.

4,965,091

SOL GEL METHOD FOR FORMING THIN LUMINESCENT FILMS

Vincent J. Fratello, New Providence; Eliezer M. Rabinovich, Berkeley Heights, and Joseph Shmulovich, New Providence, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 1, 1987, Ser. No. 103,986
Int. Cl.[3] B05D *5/06*
U.S. Cl. 427—64 15 Claims



1. A method for fabricting a device, comprising the steps of:
forming a complex oxide capable of luminescing when impinged by energy, said complex oxide including at least first and second cations, said first cation being selected from the group consisting of silicon and aluminum, and said second cation being selected from the group consisting of rare earth elements with atomic number 57–71 and yttrium; and
completing the fabrication of said device, said completing step including the step of incorporating a substrate coated with said complex oxide into said device, characterized in that
said forming step includes the steps of
(a) dissolving in an aqueous solution salts comprising at least one second cation element, said salts being selected

from the group consisting of nitrate, chloride, bromide, iodide, and sulfate,

(b) mixing said salts solution with a metal alkoxide containing said first cation to promote hydrolysis of said alkoxide with formation of a sol capable of gellation to provide a sol. . . (c) applying a coating of said sol to a substrate and (d) heat treating the coated substrated in a temperature range of about 800° C. to 1500° C.

4,965,092

PROCESS FOR THE MANUFACTURE OF COPPER THICK-FILM CONDUCTORS USING AN INFRARED FURNACE

Edward A. Hayduk, Jr., 1219 Eagle St., Wescosville, Pa. 18106; Walter F. Yext, 418 N. 8th St., Allentown, Pa. 18102, and David R. Taschler, R.D. #1, Box 243BB, Lyon Valley Farm Rd., Schnecksville, all of Pa. 18078

Continuation of Ser. No. 100,382, Sep. 24, 1987, abandoned. This application Apr. 28, 1989, Ser. No. 345,379

The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.

Int. Cl.[5] C23C *26/00*

U.S. Cl. 427—96 **10 Claims**

1. In a process of manufacturing thick-film electrical components by forming a paste suitable for application to a ceramic substrate, applying said paste to said substrate by a conventional screen printing technique, drying said printed substrate and firing said substrate and said paste at elevated temperature in a furnace heated by a radiant energy source having a wavelength greater than 4,000 but less than 100,000 angstroms to form said electrical component, the improvement comprising:

firing said paste and substrate composite in a hot zone of said furnace maintained at a temperature of between 850° and 1,000° C. under an inert gas atmosphere to which is added from 100 to 3,000 ppm water whereby said fired composites exhibit enhanced adhesion of said paste to said substrate.

4,965,093

CHEMICAL VAPOR DEPOSITION OF BISMUTH OXIDE

George A. Neuman, and Karl H. Bloss, both of Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 5, 1988, Ser. No. 219,693

Int. Cl.[5] B05D *5/12, 5/06*

U.S. Cl. 427—109 **10 Claims**

1. A method of forming a bismuth oxide coating by chemical vapor deposition comprising the steps of:

a. contacting a surface of a substrate in an oxidizing atmosphere with a water stable organo bismuth compound;

b. maintaining a temperature sufficient to thermally decompose said organo bismuth compound; and

c. thermally decomposing said organo bismuth compound in vapor form to deposit a bismuth oxide film on said surface.

4,965,094

ELECTROLESS SILVER COATING FOR DIELECTRIC FILTER

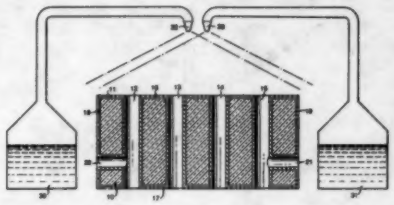
Harold E. Fuchs, Kansas City, Mo., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 27, 1988, Ser. No. 292,603

Int. Cl.[5] H01P *1/20*; B05D *3/04, 5/12*

U.S. Cl. 427—125 **6 Claims**

1. A method of fabricating a filter from a block of dielectric material which includes a plurality of formed in at least one surface thereof comprising the step of forming a silver coating on said surface including the walls of the holes by applying a



solution comprising a silver ammonia complex and a solution comprising a reducing agent.

4,965,095

METHOD FOR REFURBISHING USED JET ENGINE HOT SECTION AIRFOILS

Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

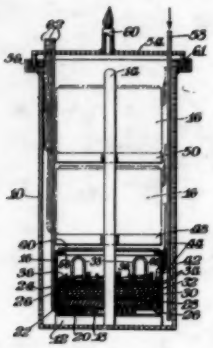
Continuation-in-part of Ser. No. 205,387, Jun. 10, 1988, Pat. No. 4,895,609, and a continuation-in-part of Ser. No. 182,718, Apr. 18, 1988, abandoned, and a continuation-in-part of Ser. No. 862,712, May 13, 1986, Pat. No. 4,871,708, and a continuation-in-part of Ser. No. 830,767, Feb. 19, 1986, Pat. No. 4,799,799, and a continuation-in-part of Ser. No. 757,606, Jul. 22, 1985, abandoned, and a continuation-in-part of Ser. No. 707,606, Mar. 4, 1985, Pat. No. 4,824,482, and a continuation-in-part of Ser. No. 685,910, Dec. 27, 1984, Pat. No. 4,820,362, and a continuation-in-part of Ser. No. 584,538, Feb. 28, 1984, Pat. No. 4,845,139, and a continuation-in-part of Ser. No. 538,541, Oct. 3, 1983, Pat. No. 4,830,931, and a continuation-in-part of Ser. No. 479,211, Mar. 28, 1983, Pat. No. 4,476,244, which is a continuation of Ser. No. 632,016, Jul. 18, 1984, abandoned, which is a continuation of Ser. No. 605,248, Apr. 30, 1984, abandoned, which is a continuation of Ser. No. 571,510, Jan. 17, 1984, Pat. No. 4,537,927, which is a continuation of Ser. No. 488,103, Apr. 25, 1983, Pat. No. 4,615,920, which is a continuation of Ser. No. 417,214, Sep. 13, 1982, abandoned, which is a continuation of Ser. No. 398,850, Jul. 16, 1982, Pat. No. 4,467,016, which is a continuation of Ser. No. 302,979, Sep. 17, 1981, abandoned, which is a continuation of Ser. No. 281,405, Jul. 8, 1981, Pat. No. 4,708,913, which is a continuation of Ser. No. 230,333, Feb. 2, 1981, Pat. No. 4,347,267, which is a continuation of Ser. No. 191,780, Sep. 29, 1980, abandoned, which is a continuation of Ser. No. 172,671, Jul. 28, 1980, Pat. No. 4,435,481, which is a continuation of Ser. No. 73,539, Sep. 7, 1979, Pat. No. 4,260,654. This application Dec. 22, 1988, Ser. No. 289,595

Int. Cl.[5] B32B *35/00*

U.S. Cl. 427—142 **2 Claims**

1. In the re-use of a used jet engine hot section airfoil that had been aluminized, the improvement according to which the used airfoil is cleaned of accumulations resulting from its use, and the cleaned airfoil is subjected to fluoridizing at a tempera-

ture at least aS high as about 1650° F. to remove the aluminum remaining from the original aluminizing and deoxidized the



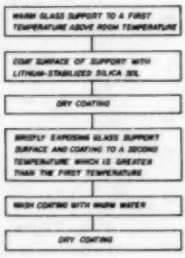
airfoil surface, and then the de-aluminized de-oxidized surface is re-aluminized.

4,965,096

METHOD FOR PREPARING IMPROVED LITHIUM-SILICATE GLARE-REDUCING COATING FOR A CATHODE-RAY TUBE

Samuel B. Deal, Manheim Township, Lancaster County, and Donald W. Bartch, Hellam Township, York County, both of Pa., assignors to RCA Licensing Corp., Princeton, N.J.

Filed Aug. 25, 1988, Ser. No. 236,403
Int. Cl.[5] H01J *31/00;* B05D *5/02*
U.S. Cl. 427—165 **5 Claims**


WARM GLASS SUPPORT TO A FIRST TEMPERATURE ABOVE ROOM TEMPERATURE
COAT SURFACE OF SUPPORT WITH LITHIUM-STABILIZED SILICA SOL
DRY COATING
BRIEFLY EXPOSING GLASS SUPPORT SURFACE AND COATING TO A SECOND TEMPERATURE WHICH IS GREATER THAN THE FIRST TEMPERATURE
WASH COATING WITH WARM WATER
DRY COATING

1. A method for preparint an optical viewing screen having a glare-reducing viewing surface comprising

(a) warming a glass support to a temperature of about 50° C.,

(b) coating a surface of said warm support with an aqueous solution containing lithium-stabilized silica sol, and drying the deposited coating,

(c) exposing said surface of said support and said deposited coating to a heat source for about 30 seconds to raise said surface and said deposited coating to a temperature of about 65° C.,

(d) washing said dry coating with water, and

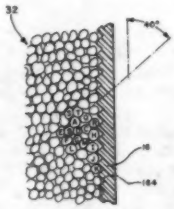
(e) drying said coating.

4,965,097

TEXTURIZED CELL MATERIAL FOR CONFINEMENT OF CONCRETE AND EARTH MATERIALS

Gary Bach, Appleton, Wis., assignor to Reynolds Consumer Products, Inc., Appleton, Wis.

Filed Jan. 11, 1989, Ser. No. 295,890
Int. Cl.[5] E02D *29/00, 5/03;* E02B *3/04*
U.S. Cl. 428—194 **16 Claims**



1. A cell material structure for confinement of earth material, comprising:

a plurality of plastic strips bonded together on their faces in a side by side relationship at bonding areas which are staggered from strip to strip such that the plurality of strips may be stretched in a direction perpendicular to the faces of the strips to form a layer of cells open at the top and bottom;

said strips comprising two outside strips and one or more inside strips;

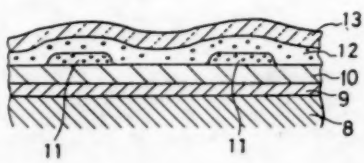
said strips comprising at least one texturized surface having a texture which creates an angle of friction of about 20 degrees to about 60 degrees between the surface and the adjacent fill material.

4,965,098

TWO-TONE PAINT FILM

Jun-ichi Handa, Toyota; Hiroshi Ito, Ichinomiya, and Taketoshi Minohara, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 13, 1989, Ser. No. 379,557
Claims priority, application Japan, Jul. 19, 1988, 63-179952
The portion of the term of this patent subsequent to Sep. 4, 2007, has been disclaimed.
Int. Cl.[5] B32B *5/16;* B60R *13/04;* C09D *5/29*
U.S. Cl. 428—203 **24 Claims**



1. A two-tone paint film, comprising a first paint film and a second paint film formed adjacent to said first paint film,

each of said first paint film and said second paint film including pigment comprising a ceramic flake-like substrate, a transparent inorganic thin film layer formed on the surface of said substrate, and glittering portions having metallic luster comprising metal dots or alloy dots formed on the surfaces of said thin film layer, and

said pigment of said first paint film and said pigment of said second paint film having different ratios of the total areas

of said glittering portions to the entire surface area of said thin film layer from each other.

4,965,099

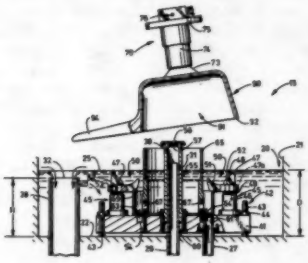
APPARATUS AND METHOD FOR SELECTIVELY COATING THE INNER SURFACE OF A HOLLOW BODY

James R. Bornhorst, Xenia, Ohio, assignor to Valco Cincinnati, Inc., Cincinnati, Ohio

Filed Oct. 27, 1989, Ser. No. 428,183

Int. Cl.[5] B05D 7/22; B05C 3/02

U.S. Cl. 427—230 27 Claims



1. An apparatus for automatically and selectively coating an area of the inner surface of a hollow body with a liquid, said hollow body having a closed end and an open end with an edge defining that open end, said apparatus comprising:

a coating tank for containing a volume of coating liquid at a predetermined liquid level;

means for supporting an inverted hollow body such that its open edge is partially submerged in said volume of coating liquid to thereby provide a closed cavity within the closed end of said inverted hollow body and above the level of said liquid;

a vent tube having first and second ends, said vent tube being in fluid communication with a variable pressure source adjacent its first end, and being disposed within said tank such that its second end can be in fluid communication with said closed cavity of a supported inverted hollow body; and

a coating control partition substantially circumscribing said vent tube and having a top edge, said partition disposed within said tank and extending upwardly above said liquid level such that said top edge is within said closed cavity, whereby the liquid level within said closed cavity can be raised by creation of an underpressure therewithin, said liquid level within said closed cavity rising until it flows over said top edge of said control partition, whereby the rising level of such liquid is effectively positively controlled by said partition.

24. A method for automatically and selectively coating portions of the inner surface of a hollow body having a closed end and an open edge, said method comprising the following steps:

supporting a hollow body in inverted condition on a coating fixture disposed at least partially in a coating reservoir containing a volume of coating liquid having a liquid level, such that the open edge of said hollow body is partially submerged in said volume of liquid to thereby provide a closed cavity within the closed end of said inverted hollow body, said fixture having a coating control partition having a top edge extending upwardly above said liquid level; creating an underpressure within said closed cavity to thereby raise the level of said liquid within said closed cavity and on the outer perimeter of said control partition;

maintaining the underpressure within said closed cavity until the level of said liquid rises above said top edge of said control partition and begins to flow inwardly over said top edge;

removing the underpressure from within said closed cavity, thereby permitting the liquid to recede to its level; and

removing the coated hollow body from the coating fixture.

4,965,100

CONDITIONING OF FABRICS

Arthur G. Leigh, Heswall, and Douglas Wraige, Upton by Chester, both of England, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Filed Sep. 20, 1989, Ser. No. 409,702

Claims priority, application United Kingdom, Sep. 30, 1988, 8823007

Int. Cl.[5] B05D 3/12

U.S. Cl. 427—242 8 Claims

1. An article suitable for conditioning fabrics in a tumble dryer, comprising a combination of a substrate and a fabric-conditioning composition, the substrate comprising a porous material having a void volume of more than 90% and a cell count of more than 250 cells per cm, the fabric-conditioning composition comprising a fabric-softening material.

8. Method for conditioning fabrics in a tumble dryer comprising the steps of:

(a) introducing an article according to claim 1 into the tumble dryer;

(b) introducing a load of fabrics into the tumble dryer;

(c) operating the dryer at elevated temperatures while the article according to claim 1 is adhered to the tumble dryer wall until the fabrics are of satisfactory dryness;

(d) removing the fabrics from the tumble dryer, while the article according to claim 1, remains adhered to the tumble dryer wall; and

(e) repeating steps (b) to (d) until the article according to claim 1 no longer adheres to the tumble dryer wall, therewith providing a visual indication of functional exhaustion of the article.

4,965,101

CERAMIC FOAM FOR FILTERS FOR CLEANING EXHAUST GASES OF DIESEL ENGINES

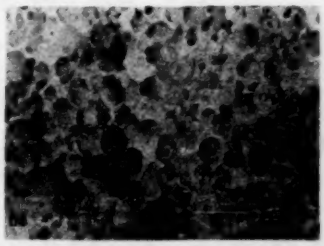
Olaf Frei, Siblingen; Max Frish, Beringen; Viktor Bodmer, and Tiberiu Mizrah, both of Schaffhausen, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Dec. 6, 1988, Ser. No. 280,689

Claims priority, application Switzerland, Dec. 10, 1987, 4825/87

Int. Cl.[5] C23C 16/00

U.S. Cl. 427—255 11 Claims



1. Method for the manufacture of a ceramic foam for filters for cleaning exhaust gases of diesel engines which comprises:

providing a ceramic foam filter body having a plurality of pores;

roughening at least one surface of said body without blocking said pores so as to improve a filter action and enhance the capture of diesel soot particles; and

said roughening step including depositing particles formed from an inorganic material on said at least one surface and thereby forming a roughening layer having a thickness in

the range of from about 10 μm to about 200 μm and a particle peak-to-peak interval of approximately 1 μm to about 100 μm so as to insure said capture of said diesel soot particles.

4,965,102

METHOD FOR COATING A METAL SUBSTRATE BY THE USE OF A RESIN COMPOSITION

Toshimi Inai, Takatsuki, and Koji Motoi, Kyoto, both of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 24, 1989, Ser. No. 314,997
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—374.4 **10 Claims**

1. A method for coating a metal substrate by the use of a resin composition comprising:

forming a coating film made of a melted resin composition on the surface of an undercoated metal substrate at a temperature of from 200° to 350° C., said resin composition containing a major amount of polyvinylidene fluoride and from 5 to 40% by weight of an inorganic filler based on the total weight of the resin composition; and

precooling said coating film to a temperature T_A and then keeping said coating film at the temperature T_A for at least one minute,

wherein said temperature T_A (°C.) satisfies the inequality:

$$T_C - 10° C. \leq T_A \leq T_C + 10° C.,$$

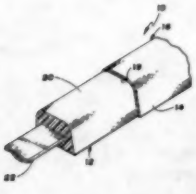
said T_C (°C.) being the crystallization temperature for the polyvinylidene fluoride.

4,965,103

UNITARY COMPOSITE MOLDING STRIP

Edward A. Roberts, Mt. Clemens, Mich.; Douglas W. Spittal, Clearwater, Canada, and Stanley T. Kisiel, Livonia, Mich., assignors to Color Custom, Inc., Warren, Mich.

Continuation-in-part of Ser. No. 114,500, Oct. 30, 1987. This application Aug. 12, 1988, Ser. No. 231,279
Int. Cl.[5] B60R *13/04*
U.S. Cl. 428—31 **6 Claims**



1. A unitary, composite molding strip consisting essentially of:

a PVC extruded plastic body having an outer surface; and

a polyurethane plastic layer co-extruded with the body of extruded plastic in a single die and having an inner surface overlying the outer surface of the PVC plastic body, the polyurethane plastic layer being interbonded with the PVC plastic body by interfusion between the surfaces while the plastic body is in a completely molten state and the plastic layer is in a completely molten state during co-extrusion in the single die to form the molding strip and to prevent the plastic layer from separating from the interbonded plastic body during use of the molding strip.

4,965,104

CONTAINERS FOR LIQUID HYDROCARBONS

Roger E. C. Barton; Adriaan W. Van Breen, and Ebel Klei, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 24, 1988, Ser. No. 261,449
Claims priority, application United Kingdom, Feb. 16, 1988, 8803536
Int. Cl.[5] B29D *22/00*
U.S. Cl. 428—34.1 **6 Claims**

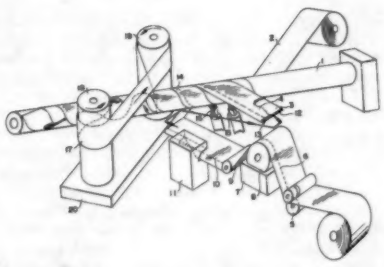
1. A thermoplastic container containing a liquid hydrocarbon fuel, characterized in that a portion of the container in contact with said liquid hydrocarbon fuel is based on copolymers of CO or SO_2, which copolymers have been prepared by polymerization of CO or SO_2 with at least one olefinically unsaturated compound A, and which polymers are made up of units —CO—(A')— respectively —SO_2(A')— and in such a manner that the adjacent —CO— respectively —SO_2— units are separated by a single unit A', wherein the, or each, A' represent a monomer unit originating in a compound A, and further characterized in that the percentage weight increase after one week immersion in gasoline is at least two times less than the percentage weight increase of Nylon-6, polypropylene, or high density polyethylene after a one week immersion in gasoline.

4,965,105

INSULATION SLEEVE FOR GALVANIC PRIMARY CELLS

Klaus Ruggeberg, Ellwangen, and Horst-Udo Jose, Fichtenau-Unterdeufstetten, Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 271,020
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1987, 3742027
Int. Cl.[5] H01M *2/02*
U.S. Cl. 428—34.2 **26 Claims**



1. An insulation sleeve for a round galvanic primary cell comprising a coiled paper strip with an absorbent underside forming an inner tubular surface of the coiled strip for absorbing electrolyte and a plastic coated upper side forming an outer tubular surface of the coiled strip for sealing in the electrolyte and for shielding the absqrbing layer, said strip having a first lengthwise edge folded over toward the underside such that the folded over edge overlaps and is adhesively joined to a second, unaltered lengthwise edge of the coiled strip.

4,965,106

FOLDED AND ASSEMBLED MOSAIC BLOCK

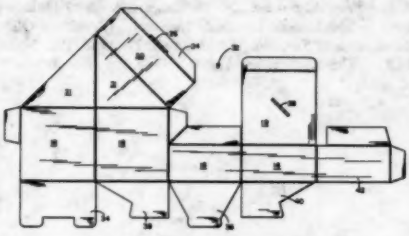
Eugene L. DeChristopher, 20 Ahlstrom Rd., Cotati, Calif. 94928

Filed Aug. 22, 1989, Ser. No. 396,973
Int. Cl.[5] B65D *5/00*
U.S. Cl. 428—34.2 **7 Claims**

1. A lightweight, hollow mosaic block for a wall sculpture comprising:

a square base including first, second, third and fourth rectangular side panels connected in series by score lines and a reinforcing panel separated from said fourth panel by a score line and extending along the inner face of said first panel, a square bottom closure and a square horizontal intermediate panel; and

triangular raised member including one upright diagonal



side face disposed diagonally across said square intermediate panel, two perpendicular upright side faces formed as integral planar continuations of said first and second side panels, and overlapped upper and lower horizontal, right triangular top panels;

there being a hinged score lines connecting said diagonal side vertical face and the upper one of said triangular top panels.

4,965,107

ONE END-SEALED CERAMIC DOUBLE WALL-STRUCTURAL TUBES

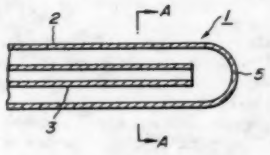
Shinji Oshima, Ama, and Hidenobu Misawa, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jun. 10, 1988, Ser. No. 205,349

Claims priority, application Japan, Jun. 24, 1987, 62-155401

Int. Cl.[5] F16L *9/18*

U.S. Cl. 428—34.4 **2 Claims**



1. A ceramic double wall-structural tube, comprising an outer tube member sealed at one end thereof, an inner tube member open at both ends thereof, and a plurality of supporting portions integrating the outer and inner tube members.

4,965,108

LOW TEMPERATURE IMPACT AND PUNCTURE RESISTANT THERMOPLASTIC FILMS AND BAGS THEREFROM

Edward N. Biel, Munster, Ind., and Edward B. Tucker, Palos Hills, Ill., assignors to First Brands Corporation, Danbury, Conn.

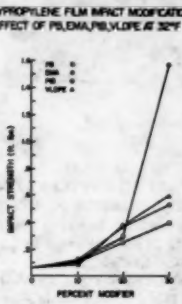
Continuation-in-part of Ser. No. 774,881, Sep. 11, 1985, abandoned. This application Mar. 9, 1987, Ser. No. 23,446

The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.

Int. Cl.[5] B29B *1/08*

U.S. Cl. 428—35.7 **14 Claims**

1. A low temperature impact and puncture resistant thermoplastic multilayer film comprising an inner film layer comprising a blend of polypropylene copolymer with between about 5 percent and about 40 percent by weight of a resin material selected from the group consisting of (a) very low density polyethylene, (b) polybutylene, (c) a copolymer of ethylene-methyl acrylate, and (d) polyisobutylene, based on the weight



of said blend; and an outer film layer comprising a resin material having a melting temperature which is higher than that of said inner film layer.

4,965,109

LOW TEMPERATURE IMPACT AND PUNCTURE RESISTANT POLYPROPYENE FILMS LAYERED FILMS AND BAGS THEREFROM

Edward B. Tucker, Palos Hills, Ill., and Edward N. Biel, Munster, Ind., assignors to First Brands Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 23,446, Mar. 9, 1987, which is a continuation-in-part of Ser. No. 774,881, Sep. 11, 1985, abandoned. This application Jan. 27, 1988, Ser. No. 148,931

The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.

Int. Cl.[5] B29D *22/00*

U.S. Cl. 428—35.7 **15 Claims**

1. A low temperature impact and puncture resistant thermoplastic multilayer film comprising an inner film layer comprising a blend of homopolymer polypropylene with between about 5 percent and about 40 percent by weight of a aresin material selected from the group consisting of (a) very low density polyethylene, (b) polybutylene, (c) a copolymer of ethylene-methyl acrylate, and (d) polyisobutylene, based on the weight of said blend; and an outer film layer comprising a resin material having a melting temperature which is higher than that of said inner film layer.

4,965,110

ELECTROSTATICALLY PRODUCED STRUCTURES AND METHODS OF MANUFACTURING

John P. Berry, Wirral, England, assignor to Ethicon, Inc. and The University of Liverpool, both of Somerville, N.J.

Continuation-in-part of Ser. No. 208,946, Jun. 20, 1988, abandoned, which is a division of Ser. No. 896,789, Aug. 15, 1986, abandoned. This application Jun. 19, 1989, Ser. No. 368,015

Int. Cl.[5] A61F *2/06*

U.S. Cl. 428—36.4 **10 Claims**

1. A tubular fibrous structure comprising small diameter fibers and substantially larger diameter fibers and bundles of fibers, said smaller diameter fibers being randomly oriented in the fibrous structure, said larger diameter fibers and bundles of fibers being circumferentially oriented with respect to the

longitudinal axis of said tubular structure, said structure including a plurality of elongated voids with the larger dimension of such voids being generally oriented circumferentially with respect to the longitudinal axis of said tubular structure.

4,965,111

OLEFINIC IMPACT MODIFIERS FOR, AND BLENDS WITH, THERMOPLASTIC POLYESTER RESINS

Charles F. Pratt, Brasschaat, Belgium; Shrikant V. Phadke, and Errol Olivier, both of Baton Rouge, La., assignors to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 161,361, Feb. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 4,089, Jan. 16, 1987, abandoned. This application Aug. 23, 1988, Ser. No. 235,314

Int. Cl.[5] C08L *67/02*

U.S. Cl. 428—36.8 **25 Claims**

1. An impact modified thermoplastic composition comprising the product produced by melt compounding:

(a) a high molecular weight thermoplastic polyester matrix resin, and

(b) an effective amount of impact modifier prepared by reacting an EPDM rubber in the molten phase with at least 2 percent based on the weight of the EPDM rubber of a graft monomer selected from the group consisting of an epoxy functional ester of acrylic acid and an epoxy functional ester of an alkyl acrylic acid in the presence of at least 0.3 percent by weight based on the weight of the EPDM rubber of a free radical initiator, said modifier having a gel content in the range of from about 10 to about 80 percent and being in the form of particles in which more than about 60 percent by weight of the particles are larger than about one micron.

4,965,112

METHOD FOR APPLYING A BLOOD-COMPATIBLE COATING TO POLYETHER-URETHANE MOULDED ARTICLES AND THE POLYMETHER-URETHANE MOULDED ARTICLES COATED IN THIS WAY

Egbert Brinkman, and Adriaan Bantjes, both of Enschede, Netherlands, assignors to Stichting Voor de Technische Wetenschappen, Utrecht, Netherlands

Filed Mar. 1, 1989, Ser. No. 317,677

Claims priority, application Netherlands, Mar. 8, 1988, 8800577

Int. Cl.[5] B29D *23/00*

U.S. Cl. 428—36.91 **11 Claims**

1. Method for applying a blood-compatible coating to a polyether-urethane moulded article, characterized in that a layer of polyethylene oxide with a weight average molecular weight in the range of 1,500-1,500,000 is applied to the polyether-urethane moulded article using heat treatment or irradiation and the polyethylene oxide layer applied is then linked to the polyethylene-urethane moulded article.

4,965,113

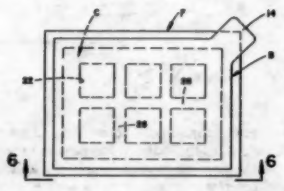
TRANSFER ADHESIVE SANDWICH AND METHOD OF APPLYING ADHESIVE TO SUBSTRATES

Wallace R. Jones, Waite Hill Village; Robert A. Isaksen, Chardon, and Paul A. Krieger, North Ridgeville, all of Ohio, assignors to The Excello Specialty Company, Cleveland, Ohio

Continuation of Ser. No. 162,110, Feb. 29, 1988, Pat. No. 4,859,512. This application Aug. 21, 1989, Ser. No. 397,038

Int. Cl.[5] B32B *7/14*

U.S. Cl. 428—40 **3 Claims**



1. A pad of adhesive sandwiches stacked on top of one another and intended for applying adhesive to substrates having a plurality of spaced apart openings therein, each sandwich including a flexible carrier sheet having a pressure-sensitive adhesive layer releasably bonded to one surface thereof, said sheet having an opposite surface to which said adhesive layer is releasably bondable with a tenacity substantially less than the tenacity of the bond between said adhesive layer and said one surface, said sandwiches being stacked with said adhesive layer on one carrier sheet engaging said opposite surface of an adjacent carrier sheet, whereby said sandwiches are strippable from said pad one by one for engaging the adhesive layer with a substrate to which the adhesive layer is bondable with a tenacity substantially greater than the tenacity of the bond between the adhesive layer and carrier sheet so that the carrier sheet is strippable from the adhesive layer which remains on the substrate, said adhesive layer having a predetermined discontinuous pattern with a plurality of spaced apart openings therein, said openings constituting areas of said carrier sheet to which adhesive has not been applied and corresponding in size and shape to the spaced-apart openings in said substrates; and, the thickness of said carrier sheet being substantially greater than the thickness of said adhesive layer.

4,965,114

OPTICAL RECORDING MEDIUM

Minoru Ikeda; Masaki Ishii; Hiroshi Ono, and Koichi Saito, all of Kurashiki, Japan, assignors to Kuraray Company, Ltd., Kurashiki, Japan

Continuation-in-part of Ser. No. 324,749, Mar. 17, 1989, abandoned. This application Dec. 19, 1989, Ser. No. 453,191

Claims priority, application Japan, Mar. 18, 1988, 63-66429

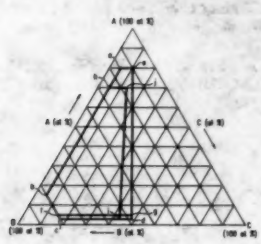
Int. Cl.[5] B32B *3/02*

U.S. Cl. 428—64 **13 Claims**

1. An optical recording medium, comprising:

a substrate and a thin metal film laminated thereon having a thickness ranging from 5 nm to 200 nm and consisting essentially of a nobel metal (A), a chalcogen (B) and bismuth (C) as essential components in amounts specified by the region of the phase diagram of FIG. 1 defined by the points: a; ($A_{80}B_{15}C_5$), b; ($A_{15}B_{80}C_5$), c; ($A_2B_{80}C_{18}$), d; ($A_2b_{49}C_{49}$) and e; ($A_{80}B_{10}C_{10}$), said medium capable of absorbing a laser beam of a specific wavelength region thereby recording information by the pits or cavities

formed in the film by the laser beam and said medium, when irradiated by laser light, having a reflectivity before



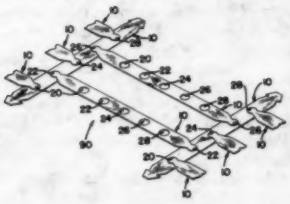
the recording of information which is within the range of from 5 to 60%.

4,965,115

MULTI-PURPOSE FLEXIBLE DEVICES, METHOD OF MAKING SAME AND ARTICLES MADE THEREFROM

Paul J. Cimillo, 180 Walnut St., Apt. A51, Montclair, N.J. 07042

Filed Jan. 4, 1989, Ser. No. 293,301
Int. Cl.[5] B65D 77/10
U.S. Cl. 428—131 3 Claims



1. A flexible device comprising an elongated sheet member made from a recycled rubber tire tread, the member being symmetrical with plurality of holes each of predetermined dimensions therethrough and barbed portions at opposite ends thereof adapted for one-way entry through a hole of said predetermined dimensions, at least some of said holes centered on said center line.

4,965,116

METHOD FOR SEPARATION OF COBALT FROM NICKEL

Michael J. Miller, and Richard A. Scheithauer, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 11, 1989, Ser. No. 405,708
Int. Cl.[5] C01G 51/00, 53/00
U.S. Cl. 423—140 4 Claims

1. A method for separating cobalt from nickel, said method consisting essentially of:

(a) adjusting the pH of a cobalt chloride solution containing nickel to about 3 to about 5 with a base;

(b) adding hypochlorite to the resulting pH adjusted solution in an amount equal to at least the stoichiometric amount required to oxidize essentially all of said cobalt to the $^{+3}$ state, while maintaining the pH at about 3 to about 5 by addition of a base, to form a solid containing at least about 60% by weight of said cobalt in the $^{+3}$ state and a liquor containing essentially all of said nickel; and

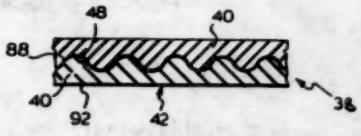
(c) removing said solid from said liquor.

4,965,117

ADHESIVE COMPOSITION, PROCESS, AND PRODUCT

Friedrich K. W. Lautenschlaeger; Reynaldo G. Bumanlag, both of Mississauga, Canada, and James A. Box, Broadview Heights, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 928,753, Nov. 7, 1986, Pat. No. 4,814,215. This application Feb. 23, 1989, Ser. No. 315,072
Int. Cl.[5] B32B 3/28; C09J 7/02
U.S. Cl. 428—182 4 Claims



1. A flexible sealant strip comprising: a deformable substrate and an adhesive layer supported on said substrate,

said adhesive layer having a body portion and a first outer surface,

a spacer element extending between opposed sides of said substrate effective to resist compressive forces applied to said substrate,

said adhesive layer being transparent to curing radiation and having a thickness of up to twice its transparent depth and comprising an essentially solvent-free adhesive polymer composition,

said adhesive layer comprising an adhesive polymer composition comprising a polymer with pendant side chains present in a predominanat amount and a cross-linking agent for said polymer and being curable only while being exposed to said curing radiation to produce a cured essentially water resistant composition curable in the presence of the curing radiation and having a transparent depth up to 1.0 inch, the curing being inhibited by oxygen,

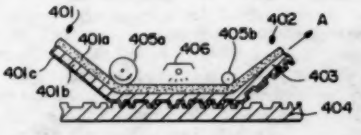
said composition being substantially cured throughout said body portion and uncured at said first outer surface portion, such that said first outer surface portion remains tacky.

4,965,118

FLEXIBLE OPTICAL INFORMATION RECORDING MEDIUM AND METHOD OF MANUFACTURING THE SAME

Tokio Kodera, Ota, and Nobuaki Kazahaya, Shinjuku, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

PCT No. PCT/JP87/00840, § 371 Date Aug. 16, 1988, § 102(e) Date Aug. 16, 1988, PCT Pub. No. WO88/03311, PCT Pub. Date May 5, 1988
PCT Filed Oct. 30, 1987, Ser. No. 219,155
Claims priority, application Japan, Oct. 30, 1986, 61-259493
Int. Cl.[5] B32B 3/00
U.S. Cl. 428—137 36 Claims



1. An adapter for use in reproduction of a flexible optical information recording medium, on which digital information is recorded as an uneven pattern corresponding thereto, said

adapter being used when a read beam is irradiated to said medium,

characterized by the provision of a lower surface adapter (511; 521; 531; 541; 551; 561; 571; 581) for supporting the lower surface of said flexible optical information recording medium, an upper surface adapter (512; 522; 532; 542; 552; 562; 572; 582) for supporting the upper surface thereof, and connection means (516, 517; 526, 527; 535, 539; 546; 555, 556; 565, 566; 576, 577; 586, 587) for connecting said both adapter so as to enable said upper surface adapter and said lower surface adapter to hold said flexible optical information recording medium therebetween.

4,965,119

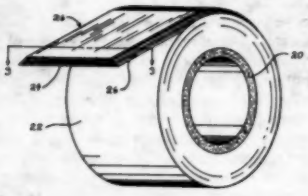
TAPERED ROOFING TAPE

Erol Sancaktar, Potsdam, N.Y., assignor to The Kendall Company, Boston, Mass.

Continuation-in-part of Ser. No. 867,110, May 23, 1986. This application Aug. 1, 1986, Ser. No. 892,678

Int. Cl.[5] B32B *23/02*

U.S. Cl. 428—192 7 Claims



1. A roofing tape adapted to provide a lap joint between two lapping roof membranes, said tape comprising a sheet material having opposed lateral edges, a leading end and a trailing end and a layer of adhesive covering both surfaces between said lateral edges, each said lateral edge being tapered outwardly from the outer surface of one said adhesive layer to the outer surface of the other said adhesive layers.

4,965,120

MAGNETIC RECORDING MEDIUM

Toshio Ono; Hiroshi Ogawa; Chiaki Mizuno, and Shinji Saito, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 27, 1988, Ser. No. 199,821

Claims priority, application Japan, May 29, 1987, 62-136364

The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—213 6 Claims

1. A magnetic recording medium comprising a nonmagnetic support having thereon a first magnetic layer and having on the first magnetic layer a second magnetic layer, in that order, said second magnetic layer comprising a magnetic particle, a binder abrasive particles and carbon black having an average primary particle diameter of 80 mμor more, said first magnetic layer comprising a magnetic particle, a binder and carbon black having an average primary particle diameter of 40 mμor less without substantially containing abrasive particles in the first magnetic layer, and the thickness ratio of the first layer to the second layer, first layer thickness/second layer thickness is 1.8 or more.

4,965,121

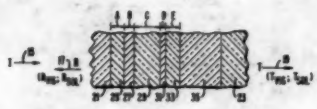
SOLAR CONTROL LAYERED COATING FOR GLASS WINDOWS

Paul I. Young, Walnut Creek, and Jesse D. Wolfe, San Ramon, both of Calif., assignors to The BOC Group, Inc., Murray Hill, N.J.

Filed Sep. 1, 1988, Ser. No. 239,590

Int. Cl.[5] G02B *5/28;* C23C *4/00;* B32B *15/04*

U.S. Cl. 428—213 15 Claims



1. A solar control glass coating having a substantially neutral visible reflected color, comprising:

a first layer of dielectric material,

a second layer, of partially reflective metallic material,

a third layer, of dielectric material,

a fourth layer, of partially reflective metallic material.

a fifth layer, of dielectric material, and

each of said first, third and fifth dielectric layers consisting of a substantially transparent dielectric material having a refractive index within a range of from 1.7 to 2.7, said first and firth layers having substantially the same optical thickness that is substantially within a range of 33–45 percent of the optical thickness of said third layer, one of said second or fourth layers has a thickness substantially within the range of from 75 to less than 100 percent of the other of the second or fourth layer.

4,965,122

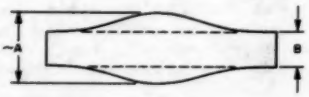
REVERSIBLY NECKED MATERIAL

Michael T. Morman, Alpharetta, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 23, 1988, Ser. No. 249,050

Int. Cl.[5] D03D *3/00*

U.S. Cl. 428—225 25 Claims



1. A reversibly necked material adapted to stretch at least about 75 percent and recover at least about 50 percent when stretched about 75 percent wherein said reversibly necked material has been necked by drawing at ambient temperature and then heated and cooled while in a necked configuration so that the material possesses a greater heat of fusion than before being reversibly necked.

4,965,123

OPAQUE ORIENTED POLYMERIC FILM STRUCTURE AND METHOD OF PREPARING SAME

Larry G. Swan, Fairport, and Ronald C. Wood, Jr., Pittsford, both of N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 29, 1989, Ser. No. 458,874

Int. Cl.[5] B32B *3/26, 7/02, 31/16*

U.S. Cl. 428—314.4 20 Claims

1. An opaque, biaxially oriented polymeric film structure comprising:

(a) a thermoplastic polymer matrix core layer having a first

surface and a second surface, within which is located a strata of voids; positioned at least substantially within a substantial number of said voids is at least one spherical void-initiating particle which is phase distinct and incompatible with said matrix material, the void space occupied by said particle being substantially less than the volume of said void, with one generally cross-sectional dimension of said particle at least approximating a corresponding cross-sectional dimension of said void; the population of said voids in said core being such as to cause a significant degree of opacity; and

(b) at least one thermoplastic polymer matrix skin layer adhering to at least said first surface of said core layer, within which is located a strata of voids; positioned within at least a substantial number of said voids is at least one void-initiating solid particle which is phase distinct and incompatible with said matrix material, the void space occupied by said particle being substantially less than the volume of said void, with one generally cross-sectional dimension of said particle at least approximating a corresponding cross-sectional dimension of said void.

4,965,124

THERMAL IMAGE TRANSFER RECORDING MEDIUM

Shuhei Shiraishi, Mishima, and Minoru Hakiri, Numazu, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 100,928, Sep. 25, 1987, Pat. No. 4,828,904. This application Sep. 30, 1988, Ser. No. 252,573

Claims priority, application Japan, Sep. 30, 1986, 61-229785; Sep. 30, 1986, 61-229786

Int. Cl.[5] B41M *5/26*

U.S. Cl. 428—327 **10 Claims**

1. A thermal image transfer recording medium comprising a substrate and an image transfer layer formed thereon, said image transfer layer comprising solid solution particles, a dye or pigment and a binder agent, said solid solution particles having as the main components a resin having a melting or softening point of 60° C. to 130° C. and a wax component having a melting or softening point of 70° C. to 130° C.

4,965,125

MAGNETIC RECORDING MEDIUM AND THE METHOD FOR PREPARING THE SAME

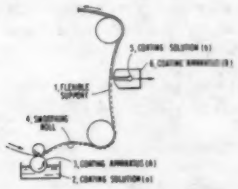
Kouichi Masaki; Hideaki Kosha; Toshihiko Miura, and Yasuo Tamai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 18, 1988, Ser. No. 182,672

Claims priority, application Japan, Apr. 17, 1987, 62-93387; Aug. 18, 1987, 62-203364

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—329 **8 Claims**



1. A magnetic recording medium comprising a non-magnetic support having thereon a magnetic layer containing ferromagnetic particles dispersed in binders, said magnetic layer containing abrasive agent particles with lubricating agent particles, wherein the weight ratio of or each of the abrasive agent particles and lubricating agent particles which are present, within 1 μm in a thickness direction from the surface of said magnetic layer to (b) or each of the abrasive agent particles and lubricating agent particles, which are present, within the whole magnetic layer is at least 100/ (thickness of magnetic layer - 1) %, in which the "thickness of magnetic layer" represents the thickness in "μm" and is 2 μm or more.

4,965,126

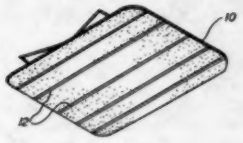
INK-REINFORCED POLYURETHANE FILMS

William W. Abraham, 37 Woodberry Rd., New Hartford, N.Y. 13413, and John S. Gentella, 274 Center Rd., Madison, N.Y. 13402

Continuation of Ser. No. 48,932, May 12, 1987. This application May 9, 1989, Ser. No. 349,488

Int. Cl.[5] C09U *7/02*

U.S. Cl. 428—343 **13 Claims**



1. A method of reinforcing a moisture-vapor-permeable polyurethane membrane comprising applying a coat of an ink material in a uniform pattern on the polyurethane membrane to strengthen the membrane.

4,965,127

ADHESIVE SHEETS

Kazuyoshi Ebe; Hiroaki Narita; Katsuhisa Taguchi; Yoshitaka Akeda, and Takanori Saito, all of Saitama, Japan, assignors to FSK Kabushiki Kaisha, Tokyo, Japan

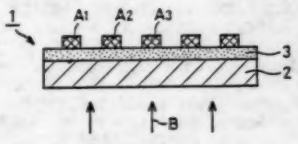
Continuation of Ser. No. 932,210, Nov. 18, 1986, Pat. No. 4,756,968. This application Oct. 22, 1987, Ser. No. 111,849

Claims priority, application Japan, Dec. 27, 1985, 60-295188; Dec. 27, 1985, 60-295189; Dec. 27, 1985, 60-295190; Mar. 3, 1986, 61-045785; Mar. 3, 1986, 61-045786; Jul. 9, 1986, 61-161680

The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.

Int. Cl.[5] C09J *7/02, 133/08, 133/10*

U.S. Cl. 428—343 **10 Claims**



1. An adhesive sheet for use in dicing wafers into chips, comprising a substrate of a synthetic resin film having coated on the surface thereof an adhesive layer comprising an acrylic or methacrylic adhesive and a radiation polymerizable acrylate compound, wherein a radiation color developable compound is coated directly on at least one side of the substrate.

4,965,128

BIODEGRADABLE POLYMER SUBSTRATES LOADED WITH ACTIVE SUBSTANCE SUITABLE FOR THE CONTROLLED RELEASE OF THE ACTIVE SUBSTANCE BY MEANS OF A MEMBRANE

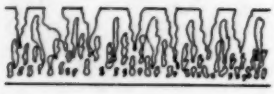
Pieter J. Greidanus, Bergschenhoek; Jan Feijen, Hengelo; Marinus J. D. Eenink, Enschede; Johannes C. Rieke; Jan Olijslager, both of Delft, and Jan H. M. Albers, Rijswijk, all of Netherlands, assignors to Nederlandse Organisatie Voor Toegepast-Natuurwetenschappe Lijk, The Hague, Netherlands

Continuation of Ser. No. 745,256, Jun. 14, 1985, abandoned. This application Feb. 26, 1988, Ser. No. 168,631

Claims priority, application Netherlands, Jun. 15, 1984, 8401912

Int. Cl.[5] B01D *39/00*; D02G *3/00*

U.S. Cl. 428—398 10 Claims



1. Biodegradable polymer substrate loaded with an active substance selected from the group consisting of drugs, hormones, insecticides, feromones and repellants for the controlled release of the active substance wherein the substrate consists of a hollow fibre having an asymmetric wall formed from a biodegradable polymer selected from the group consisting of polyhydroxy acids and poly(-amino acids) and copolymers thereof by a coagulation technique, said hollow fibre having two ends and having a hollow cavity therewithin, the hollow cavity of the hollow fibre containing the active substance and the ends of the hollow fibre being closed.

4,965,129

ARTICLE FOR ABSORBING LIQUIDS

Thomas I. Bair, and Dimitri P. Zafiroglu, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 139,746, Jan. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 12,400, Feb. 9, 1987, abandoned. This application Aug. 1, 1989, Ser. No. 388,196

Int. Cl.[5] B32B *3/06*

U.S. Cl. 428—398 16 Claims

1. An improved liquid-absorbing article having a porous outer fabric of generally cylindrical shape which is closed at both ends and is substantially filled with an absorbent material which comprises fine, fibrous, polyolefin particles, wherein the improvement comprises at least 50% by weight of the fine, fibrous polyolefin particles being composed of flash-spun polyethylene and the absorbent material comprising an effective amount of a wetting agent.

4,965,130

LATEX COATING COMPOSITION OF MULTILAYERED COPOLYMER PARTICLES OF VINYLIDENE CHLORIDE AND ACRYLIC COMONOMERS

Taeik Min, Pittsford, and Robert E. Touhsaent, Fairport, both of N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 343,660, Apr. 27, 1989, Pat. No. 4,898,782. This application Nov. 8, 1989, Ser. No. 433,254

Int. Cl.[5] C08L *27/08*

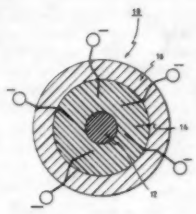
U.S. Cl. 428—407 4 Claims

1. A multi-stage semi-continuous emulsion polymerization process for preparing a multi-layered composite particle acrylic latex coating, comprising:

(a) polymerizing an acrylic seed latex by combining from about 25.4 to about 65.4 parts by weight methyl methacrylate and from about 34.6 to about 74.6 parts by weight methyl methacrylate in an aqueous catalytic solution and incubating the suspension under suitable polymerization conditions until polymerized;

(b) separating the polymerized seed latex from said monomeric components;

(c) forming an intermediate terpolymer core layer over said acrylic seed latex particles by combining said seed latex in an aqueous polymerization catalytic solution with from about 78.2 to about 98.2 parts by weight vinylidene chloride, from about 5.7 to about 15.7 parts by weight methyl acrylate, and from about 0.5 to about 1.5 parts by weight methacrylic acid under suitable polymerization conditions



until said intermediate core layer is formed over said acrylic seed latex particles in an aqueous suspension;

(d) forming an outer skin layer over said intermediate core layer by adding to said aqueous suspension from about 68 to about 78 parts by weight VDC, from about 16 to about 26 parts by weight methacrylate, and from about 0.5 to about 1.5 parts by weight methacrylic acid under suitable polymerization conditions until the outer skin layer is formed about said intermediate core layer in said aqueous emulsion; and,

(e) separating multi-layered latex particles from said monomeric components in an aqueous latex suspension.

4,965,131

COLLOIDALLY STABILIZED SUSPENSION PROCESS

Mridula Nair, Penfield; Zona R. Pierce, and Donna A. DiPrima, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 21, 1988, Ser. No. 170,519

Int. Cl.[5] B32B *27/14*; G03G *5/00*

U.S. Cl. 428—407 9 Claims

1. Polymer particles having a core of polymer coated with a layer of smaller particles comprising a copolymer of

(1) about 25 to about 80 percent by weight, based on total monomer weight, of an addition polymerizable nonionic oleophilic monomer;

(2) about 5 to about 45 percent by weight, based on total monomer weight, of an addition polymerizable nonionic hydrophilic monomer;

(3) about 1 to about 50 percent by weight, based on total monomer weight, of an addition polymerizable ionic monomer; and

(4) 0 to about 20 percent by weight based on total monomer weight, of a crosslinking monomer having at least two addition polymerizable groups.

4,965,132

HEAT TRANSFER SHEET

Akira Mizobuchi; Yoshiaki Hida; Shigeki Umise, all of Tokyo; Kyoichi Yamamoto, and Kyohei Takahashi, both of Sagamihara, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Continuation of Ser. No. 135,328, Dec. 21, 1987, abandoned, which is a continuation of Ser. No. 766,297, Aug. 16, 1985, Pat. No. 4,732,815. This application Jun. 12, 1989, Ser. No. 364,572

Claims priority, application Japan, Aug. 20, 1984, 59-172998; Aug. 20, 1984, 59-172999; May 10, 1985, 60-99378

Int. Cl.[5] B41M 5/26

U.S. Cl. 428—411.1 1 Claim

1. A hot melt heat transfer sheet for heat-sensitive printing means of thermal heads, comprising a base film, a substantially smooth antisticking layer formed on the thermal head-contacting surface of said base film, and a hot melt ink layer formed on the opposite surface of said base film,

said antisticking layer preventing sticking of the heat sheet to the thermal heads and containing an antistatic agent selected from the group consisting of:

cationic antistatic agents having cationic groups selected from a quaternary ammonium salt, a pyridinium salt and primary, secondary or tertiary amino groups;

anionic antistatic agents having anionic groups selected from sulfonate and sulfate;

amphoteric antistatic agents of amino acid type or amino-sulfate type;

nonionic antistatic agents of amino-alcohol type glycerin type, or polyethylene glycol type;

polymeric antistatic agents obtained by polymerizing the antistatic agents described above;

polymerizable antistatic agents of a radiation polymerizable monomer and oligomer having a tertiary amino or quaternary ammonium group and

carbon black.

4,965,133

MODIFYING AGENT FOR CONDUCTIVE SUBSTRATE

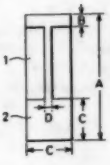
Satoshi Ueyama, and Satoru Isoda, both of Hyogo, Japan, assignors to Kozo Iizuka, Director General, Agency of Industrial Science and Technology, Tokyo, Japan

Division of Ser. No. 243,600, Sep. 13, 1988. This application Dec. 4, 1989, Ser. No. 444,946

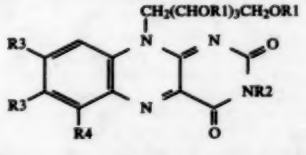
Claims priority, application Japan, Dec. 24, 1987, 62-325525

Int. Cl.[5] B32B 9/04

U.S. Cl. 428—411.1 6 Claims



1. A conductive substrate, at least a portion of which has been chemically modified by being immersed in a solution containing an effective amount of a flavin derivative represented by the formula:



wherein R1 represents a hydrogen atom or an acyl group, R2 and R3 each represent a hydrogen atom or a lower alky group having one to four carbon atoms, and R4 represents a thiocyanato group or a mercapto group.

4,965,134

METHOD FOR MANUFACTURING HIGHLY HEAT-RESISTANT DIELECTRICS

Hellmut Ahne, Roettenbach, and Albert Hammerschmidt, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

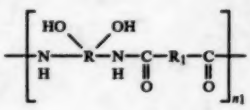
Filed May 9, 1988, Ser. No. 191,388

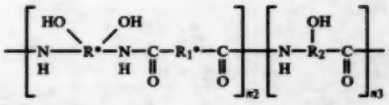
Claims priority, application Fed. Rep. of Germany, May 18, 1987, 3716630

Int. Cl.[5] B32B 9/04; B05D 5/12

U.S. Cl. 428—411.1 18 Claims

1. A method for manufacturing highly heat-resistant dielectrics, based upon organic polymers, on a substrate, comprising the steps of applying a polybenzoxazole precursor which is dissolved in an organic solvent, to the substrate; removing the solvent; and annealing the polybenzoxazole precursor at a temperature between 200° and 500° C., whereby the polybenzoxazole precursor is converted into a polybenzoxazole, wherein the polybenzoxazole precursor has the following structure:





where R, R*, R_1, R_1* and R_2 are aromatic residues and where:
$n_3 = 1$ to 100, $n_1 = n_2 = 0$, or
n_1 and $n_3 = 1$ to 100, $n_2 = 0$.

where R, R*, R_1, R_1* and R_2 are aromatic residues and where: $n_3 = 1$ to 100, $n_1 = n_2 = 0$, or n_1 and $n_3 = 1$ to 100, $n_2 = 0$

18. A permanent coating for the surface of a substrate comprising a highly heat resistant dielectric on said substrate produced according to the method of claim 1.

4,965,135

MULTILAYER FILM WITH DEAD FOLD AND TWISTABILITY CHARACTERISTICS

Jang-hi Im, Midland, Mich.; Rexford A. Mangana, Baton Rouge, La., and David R. Kiesel, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 14, 1987, Ser. No. 133,595

Int. Cl.[5] B32B 27/36, 27/08; B65D 85/00

U.S. Cl. 428—412 16 Claims

1. A multilayer film comprising at least 25 alternating layers of a first material and a second material, said first material comprising a ductile polymeric material having at least one distinct yield point, and wherein said first material is selected from the group consisting of polycarbonate, polyolefin, and nylon, said second material comprising a brittle polymeric material capable of fracturing upon the application of tensile stress and wherein said second material is selected from the group consisting of polystyrene, styrene-acrylonitrile copolymer, and poly (vinyl chloride), and the number of alternating layers being sufficient to cause said film to exhibit dead fold, creasing, and/or twistability characteristics.

4,965,136
EXTRUDED VINYLIDENE CHLORIDE COPOLYMER FLEXIBLE PACKAGING FILM

Walter B. Mueller, Inman, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Aug. 16, 1988, Ser. No. 232,740
Int. Cl.[5] B32B *27/38, 13/12;* B29D *9/00*
U.S. Cl. 428—414 8 Claims

1. A multilayer, extruded, polymeric film comprising:
(a) first and second polymeric film layers; and
(b) a barrier layer disposed between said first and second layers, said barrier layer consisting essentially of a blend of
(1) about 0.01% to 2% organic silicon polymer by weight, and
(2) at least one vinylidene chloride copolymer wherein the major portion is vinylidene chloride.

4,965,137
LIQUID PREPARATION FOR THE PRODUCTION OF ELECTRICALLY CONDUCTIVE AND INFRARED-REFLECTING FLUORINE-DOPED TIN OXIDE LAYERS ON GLASS OR GLASS-CERAMIC SURFACES, AS WELL AS A METHOD FOR THE PRODUCTION OF SUCH LAYERS

Erich Ruf, Essen, Fed. Rep. of Germany, assignor to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

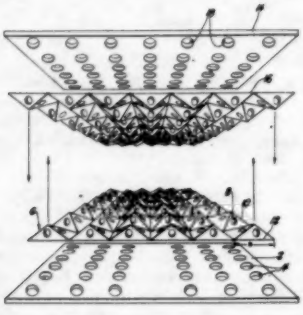
Filed Sep. 19, 1988, Ser. No. 246,427
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1987, 3735574
Int. Cl.[5] B32B *15/00;* B05D *5/06*
U.S. Cl. 428—432 8 Claims

1. In a method for the formation of electrically conductive and infrared-reflecting tin oxide layers on a glass or glass-ceramic substrate, wherein an organic solution containing tin-IV-chloride, with or without organic groups, as tin oxide layer-forming agent and a fluorine-containing doping agent is sprayed on the surface of the substrate having a temperature of 400° to 800° the improvement which comprises that the solution contains tin-II-fluoride as the sole doping agent.

4,965,138
STRUCTURAL PANEL

René Gonzalez, 28294 Pierce St., Southfield, Mich. 48076

Filed Sep. 20, 1989, Ser. No. 409,910
Int. Cl.[5] F41H *5/06, 7/04*
U.S. Cl. 428—593 18 Claims

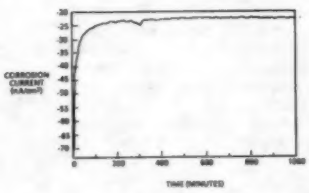


1. A cast-as-one-piece structural panel for fabricating hulls and bodies for vehicles, comprising:
a first plate having an exterior first plate surface and an interior first plate surface, the interior first plate surface disposed completely in a first plane;
a second plate spaced from the first plate, the second plate having a second plate surface faced toward the first plate;
a cross corrugated metal panel integrally cast with the first and second metal plates, the cross corrugated panel having an array defining two sets of generally pentahedrally shaped chambers with the plates;
the first plate forming a single side of each chamber in the first set and the second plate forming a single side of each chamber in the second set;
the chambers in the first set having walls shared with chambers of the second set;
the pentahedrally shaped chambers in the first set having one corner terminating at the second metal plate and the pentahedrally shaped chambers in the second set having another corner terminating at the first metal plate.

4,965,139
CORROSION RESISTANT METALLIC GLASS COATINGS

Lawrence T. Kabacoff, Columbia, Md., and William Ferrando, Arlington, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 1, 1990, Ser. No. 486,655
Int. Cl.[5] B32B *15/18*
U.S. Cl. 428—682 27 Claims



1. A coated object comprising:
A. a structure having an exposed surface of a crystalline metal material which is a cast iron, a carbon steel, a low carbon steel, an alloy steel, or a low-alloy steel, and
B. an amorphous metal alloy coating covering the exposed surface and having a composition of
(1) from 8 to 30 atomic percent of a metalloid which is boron, silicon, or mixtures thereof, and
(2) the remainder being a modified metal composition formed by replacing from more than zero to 25 weight percent of the crystalline metal material with aluminum;
wherein the amorphous metal alloy coating is formed from the metalloid and the modified metal composition by vapor deposition and wherein the amorphous metal alloy coating is anodic in reference to the crystalline metal material in the environment of use.

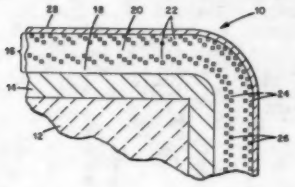
4,965,140
COMPOSITE COATINGS ON REFRACTORY SUBSTRATES

Vinod K. Sarin, Lexington, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 5,003, Jun. 14, 1988, Pat. No. 4,751,109. This application Jun. 14, 1988, Ser. No. 206,401
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—698 10 Claims

1. A wear resistant article comprising a hard refractory substrate body and a fully dense, adherent, wear resistant, composite refractory layer on the substrate body, the composite refractory layer having at least two phases and comprising:
a continuous nitride layer about 0.1–20 microns thick comprising at least one first refractory nitride of Si, B, Al, Y, Ti, Zr, Hf, V, Nb, Ta, Mo, or W; and

at least one discontinuous additional phase dispersed as discrete particles within the nitride layer, and comprising at least one second refractory nitride of Si, B, Al, Y, Ti, Zr, Hf, V, Nb, Ta, Mo, or W;



wherein the at least one second refractory nitride is different from the at least one first refractory nitride.

4,965,141

ELECTRIC CELL HOUSING DEVICE FOR CAMERA

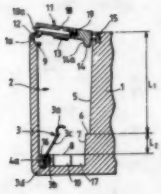
Shinichi Suzuki, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Nov. 3, 1989, Ser. No. 431,210

Claims priority, application Japan, Nov. 7, 1988, 63-144384[U]; Nov. 7, 1988, 63-144385[U]

Int. Cl.[5] H01M *2/02*

U.S. Cl. 429—9 **11 Claims**



1. A cell housing device capable of selectively housing a first cell relatively longer in length and elongated in the longitudinal direction or a second electric cell relatively greater in diameter and shorter in length, comprising:

a housing chamber provided with an opening through which said first or second cell is inserted, and comprising a first housing portion having a depth sufficient to house said first cell and a relatively large cross sectional size corresponding to said second cell and a second housing portion being defined integral with said first housing portion and having a depth and a relatively small cross sectional size sufficient to house therein a portion of said first cell;

a cover for closing or opening of said housing chamber;

elastic means for biasing said first or second cell inserted into said housing chamber toward to said opening;

engaging means which is extended inwardly into said opening of said housing chamber and temporarily engage one edge of the inserted cell against the biasing forces of said elastic means; and

disengaging means provided on said cover and capable of releasing said temporarity engagement of said engaging means with said inserted cell in response to the closing action of said cover.

4,965,142

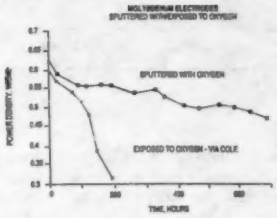
MOLYBDENUM-PLATINUM-OXIDE ELECTRODES FOR THERMOELECTRIC GENERATORS

Duane J. Schmatz, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 1, 1989, Ser. No. 359,597

Int. Cl.[5] H01M *6/36*; B05D *5/12*

U.S. Cl. 429—11 **20 Claims**



1. An article suitable for use in thermoelectric generators, which article comprises a solid electrolyte carrying thereon a thin film electrode comprising molybdenum-platinum-oxide deposited by physical deposition of molybdenum and platinum in an atmosphere comprising at least about 10 percent oxygen by volume, said thin film electrode (a) having a thickness between about 0.5 and about 10 μm and (b) comprising between about 5 and 20 mole percent platinum.

4,965,143

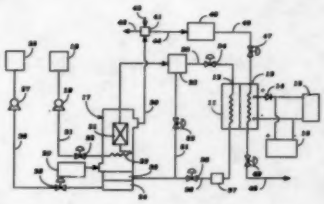
SHUTDOWN METHOD FOR FUEL CELL SYSTEM

Yutaka Mizuno; Toshiharu Hanajima, and Hisayoshi Matsubara, all of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Nov. 9, 1989, Ser. No. 435,041

Int. Cl.[5] H01M *8/04*

U.S. Cl. 429—17 **30 Claims**



1. The method of shutting down a reformer for reforming a fuel for supply to the fuel port of a fuel cell to generate electrical energy, the reformer being comprised of a catalyst bed and a heater for vaporizing the fuel for supply to the catalyst bed, said shutdown method comprising the steps of reducing the amount of heat supplied to the heater while continuing to supply unreformed fuel to the catalyst bed for cooling the catalyst bed through an endothermic reaction until the temperature of the catalyst bed falls below its working temperature by a predetermined amount and thereafter discontinuing the supply of unreformed fuel to the catalyst bed.

4,965,144

RELEASABLE PRESSURE VENTS

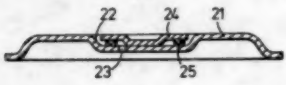
Andrew S. O. Ng, Jardine's Lookout, and Peter P. T. Ling, Kowloon, both of Hong Kong, assignors to Sylvia Industries Ltd., New Territories, Hong Kong

Filed Dec. 5, 1989, Ser. No. 446,046

Claims priority, application United Kingdom, Sep. 29, 1988, 8822836

Int. Cl.[5] H01M 2/12

U.S. Cl. 429—55 9 Claims



1. A resealable pressure vent for a pressurized container having a wall containing an aperture connecting the interior of the container with the atmosphere, said resealable pressure vent comprising a cover member adapted to close the aperture and comprising a metal plate spot welded at its center to said wall of the container and an elastic O-ring compressed between the wall of the container and the cover member such that said O-ring encircles the spot welded center of the metal plate and the aperture, the O-ring serving to seal the aperture from the exterior of the container by its compression between the wall and the plate and being displaceable by an excess of pressure in the container to vent the interior for returning to its sealing position when the excess pressure is relieved by snapping back toward its original diameter.

4,965,145

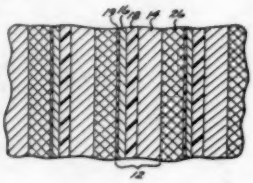
ELECTRICAL STORAGE CELL RESISTANT TO FREEZING

Howard H. Rogers, Torrance, and Steven J. Stadnick, Long Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 1, 1989, Ser. No. 388,230

Int. Cl.[5] H01M 4/92, 12/00

U.S. Cl. 429—101 16 Claims



1. An electrical storage cell that is resistant to freezing, comprising:

storage means including a plurality of active plate sets, each plate set including a positive electrode, a porous hydrogen negative electrode, and a separator between the positive electrode and the negative electrode, the hydrogen negative electrode comprising a substrate having a layer of a sintered mixture of electrically conductive particles and a binder thereon, the layer of the sintered mixture having a thickness of at least about 0.007 inches; and

a pressure vessel that contains the plate sets.

4,965,146

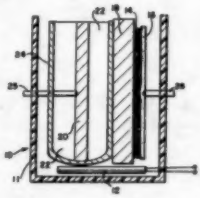
MOLTEN MEMBRANE ELECTROLYTE BATTERY

Francis P. McCullough, Jr.; Robert A. Cipriano, both of Lake Jackson, and R. Vernon Snelgrove, Damon, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 250,789, Sep. 28, 1988, Pat. No. 4,886,715, which is a continuation-in-part of Ser. No. 4,003, Jan. 16, 1987, abandoned, which is a continuation-in-part of Ser. No. 3,974, Jan. 16, 1987, abandoned. This application Sep. 20, 1989, Ser. No. 409,840

Int. Cl.[5] H01M 4/40, 6/14

U.S. Cl. 429—102 11 Claims



1. A primary rechargeable electrical energy storage device comprising a housing having an electrically non-conductive interior surface, at least one cell positioned in said housing, each cell comprising an anode consisting of a low melting metal selected from the group consisting of alkaline earth metal, alkaline earth metal alloys, alkali metal, alkali metal alloy and alkali metal eutectic mixtures thereof, a separator surrounding said anode, said separator being coated with a film of lithium nitride and capable of transporting or passing ionic species and electrically isolating said anode, a cathode, and a non-aqueous electrolyte associated with said cathode.

4,965,147

SEPARATOR FOR AN ELECTROCHEMICAL CELL OF THE METAL-AIR TYPE AND HAVING AN ALKALINE ELECTROLYTE

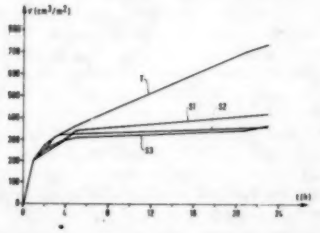
Jean-Claude Mas, and André Mendiboure, both of Levallois Perret, France, assignors to Societe Anonyme dite: CIPEL, Levallois Perre, France

Filed Jul. 17, 1989, Ser. No. 380,404

Claims priority, application France, Jul. 25, 1988, 88 10018

Int. Cl.[5] H01M 2/16

U.S. Cl. 429—136 7 Claims



1. An improved composite separator, for use in an electrochemical primary cell of the metal-air type having an alkaline electrolyte, including a support constituted by woven or non-woven fibers and at least one film of moderately cross-linked polyvinyl alcohol forming a lattice, the improvement consisting in selecting the structure and materials of said composite separator so that: said film has a very low permeability to the diffusion of dissolved oxygen; said separator absorbs between

150 g.m^{-2} and 300 g.m^{-2} of 8.5N potassium hydroxide electrolyte solution, said solution being imprisoned in the polyvinyl alcohol lattice without the possibility of hydrodynamic exchange with the rest of said cell; and said separator has an electrolytic resistance in the range of 0 mΩ.cm^{-2} and 2 mΩ.cm^{-2}, and a thickness of less than 0.2 mm.

4,965,148

PACKED BATTERIES AND METHOD OF MAKING THE SAME

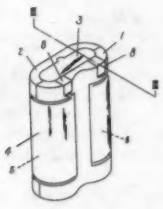
Fumio Daio, Nara; Yukimasa Niwa, and Kenji Yoshida, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sep. 27, 1989, Ser. No. 413,403

Claims priority, application Japan, Sep. 28, 1988, 63-243018

Int. Cl.^{5} H01M *6/42*

U.S. Cl. 429—159 **9 Claims**



1. A packed battery comprising:

(a) a power generating element including a plurality of cylindrical cells disposed side-by-side and electrically connected in series by a conductive connector, and an adhesive-backed labeling sheet member wrapped around the peripheries of the respective cylindrical cells;

(b) a frame holding therein said power generating element and composed of a pair of generally I-shaped frame members molded of synthetic resin and joined together to define therebetween a substantially hollow space with one end open for receiving therein said power generating element, and an end cap molded of synthetic resin and joined with said frame members to close said open end; and

(c) a pair of terminals attached to one of said frame members, each said terminal having one end connected to one of two terminal ends of said power generating element, the other end of said terminal being exposed to the outside of said frame for permitting electric current to be drawn from the power generating element.

4,965,149

METAL JACKET AND DRY CELL USING THE SAME

Ryohei Ashihara, Neyagawa; Kikumitsu Suehiro, Moriguchi; Masayuki Yabuta, Kurita, and Hideaki Yamagishi, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 10, 1989, Ser. No. 321,746

Claims priority, application Japan, Mar. 10, 1988, 63-56652

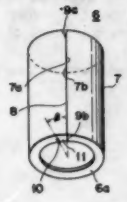
Int. Cl.^{5} H01M *2/02*

U.S. Cl. 429—168 **21 Claims**

1. An outer metal jacket for surrounding an inner housing of a dry cell, comprising:

upper and lower ring-shaped rims; and

a safety mechanism comprising a part of at least one of said upper and lower rims which has a smaller mechanical



strength than any other part on the same respective one of said at least one of said upper and lower rims.

4,965,150

PREPARATION OF VO_2(B) AND A NON-AQUEOUS SECONDARY CELL USING VO_2(B) CATHODE

Jeffrey R. Dahn, Surrey; Tony Van Buuren, New Westminster, and Ulrich Vonsacken, Port Coquitlam, all of Canada, assignors to Moli Energy Limited, Canada

Filed Sep. 8, 1988, Ser. No. 241,853

Int. Cl.^{5} H01M *4/48*; C01B *13/14*

U.S. Cl. 429—194 **10 Claims**

1. A non-aqueous secondary cell comprising an anode comprising lithium metal, an electrolyte, and a cathode comprising VO_2(B), which VO_2(B) is prepared by a process including the steps of:

maintaining NH_4VO_3 at a decomposition temperature between about 200° C. and about 537° C. while contacting said NH_4VO_3 with an atmosphere comprising excess ammonia, whereby ammonia and water vapor are liberated, leaving a residue of VO_2(B),

separating said liberated water vapor from said VO_2(B), and recovering said VO_2(B).

4,965,151

SOLID-STATE ELECTROCHEMICAL CELL

Kazunori Takada, Osaka; Yasuharu Yamamura, Katano, and Shigeo Kondo, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 23, 1990, Ser. No. 468,555

Claims priority, application Japan, Jan. 24, 1989, 1-15317; Mar. 17, 1989, 1-67063; Jun. 9, 1989, 1-147897; Aug. 23, 1989, 1-216346

Int. Cl.^{5} H01M *4/54, 6/18*

U.S. Cl. 429—191 **13 Claims**

1. A solid-state electrochemical cell comprising at least one pair of electrodes and a silver-ion conductive solidelectrolyte layer disposed between the electrodes, wherein at least one of said electrodes contains as an electrode active material a compound oxide composed of silver and transition metal oxide.

4,965,152

HOLOGRAPHIC NOTCH FILTERS

Dalen E. Keys, Wilmington; William K. Smothers, Hockessin, and Torence J. Trout, Yorklyn, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 144,840, Jan. 15, 1988, abandoned. This application Jul. 14, 1989, Ser. No. 380,184

Int. Cl.^{5} G03H *1/04, 1/06*

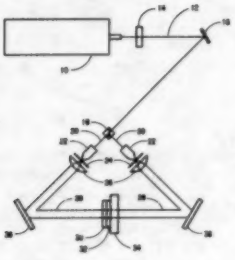
U.S. Cl. 430—1 **21 Claims**

1. A holographic notch filter comprising a transparent substrate that bears a transparent polymeric film containing a reflection hologram, said reflection hologram having an optical density of greater than approximately 2 at the wavelength

of maximum reflection and said film, prior to recording of the hologram, consisting essentially of:

(a) approximately 25 to 75% of a polymeric binder selected from the group consisting of polyvinyl acetate, polyvinyl butyral, polyvinyl acetal, polyvinyl formal, interpolymers containing major segments thereof, and mixtures thereof;

(b) approximately 5 to 60% of an ethylenically unsaturated liquid monomer containing at least one phenyl, biphenyl,



phenoxy, naphthyl, naphthyloxy, heteroaromatic groups containing up to three aromatic rings, chlorine or bromine moiety;

(c) approximately 0 to 25% of a plasticizer; and

(d) approximately 0.1 to 10% of a photoinitiator system activatable by actinic radiation;

wherein said percentages are weight percentages based on total film weight.

4,965,153

OPTICAL RECORDING MEDIUM

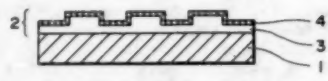
Hiroyuki Imataki, Kawasaki; Mizuho Hiraoka, Isehara; Sachiko Ichikawa, Sagamihara; Hitoshi Yoshino, Atsugi, and Yoshihiro Ogawa, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1987, Ser. No. 39,022

Claims priority, application Japan, Apr. 21, 1986, 61-89953

Int. Cl.[5] G03C *1/72*; B41M *5/24*; G11B *7/24*

U.S. Cl. 430—11 **11 Claims**



1. A method of preparing an optically recorded member comprising a recording layer comprising a light reflective layer and a light absorptive layer, for writing and reading information using a light beam, said method comprising the steps of:

forming the light absorptive layer on a non-pre-formatted substrate, the light absorptive layer having a first side and a second side, the first side being on the non-pre-formatted substrate;

thereafter forming a pre-format of guide grooves using a stamper or a mold on the second side of the light absorptive layer;

forming a light reflective layer on the second side of the light absorptive layer; and

irradiating a laser beam on the thus created optical recording medium to form pits on the crest and/or the groove to effect recording.

3. A method of preparing an optical recording medium comprising a recording layer comprising a light reflective layer and a light absorptive layer having a first side and a second side, for writing and reading information using a light beam, comprising the steps of:

forming the light absorptive layer on a non-pre-formatted substrate, the light absorptive layer having on the first side the non-preformatted substrate;

thereafter forming a pre-format of guide grooves using a stamper or a mold on the second side; and

forming a light reflective layer on the second side of the light absorptive layer.

4,965,154

ELECTROPHOTOGRAPHIC PHOTORECEPTOR HAVING SURFACE LAYERS

Kenichi Karakida; Shigeru Yagi; Yuzuru Fukuda; Masayuki Nishikawa; Te Nam Roh; Noriyoshi Takahashi, and Masato Ono, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 61,969, Jun. 15, 1987, abandoned. This application Jun. 19, 1989, Ser. No. 368,103

Claims priority, application Japan, Jun. 16, 1986, 61-138177; Jun. 16, 1989, 61-138176

Int. Cl.[5] G03G *5/082*

U.S. Cl. 430—58 **13 Claims**

1. An electrophotographic photoreceptor comprising:

a photoconductor layer substantially composed of amorphous silicon;

a first surface layer having a first thickness, disposed to cover said photoconductive layer, substantially composed of a mixture of amorphous silicon and nitrogen atoms, said nitrogen atoms having a first predetermined concentration which is homogenous across the thickness of said first layer;

a second surface layer having a second thickness, disposed to cover said first layer, substantially composed of a mixture of amorphous silicon and nitrogen atoms, said nitrogen atoms having a second predetermined concentration which is greater than said first predetermined concentration and is homogenous across the thickness of said second layer.

4,965,155

ORGANIC PHOTOCONDUCTIVE MATERIAL FOR ELECTROPHOTOGRAPHY

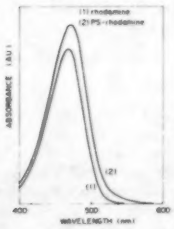
Toshihiko Nishiguchi, and Mika Yamamura, both of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Dec. 2, 1988, Ser. No. 279,083

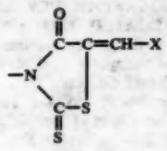
Claims priority, application Japan, Dec. 3, 1987, 62-308178; Dec. 17, 1987, 62-321033; Dec. 17, 1987, 62-321034; Dec. 18, 1987, 62-322308; Dec. 18, 1987, 62-322309; Dec. 28, 1987, 62-333451; Dec. 28, 1987, 62-333452; Dec. 28, 1987, 62-333453; Dec. 28, 1987, 62-333454; Dec. 28, 1987, 62-333455

Int. Cl.[5] G03G *5/07*

U.S. Cl. 430—58 **16 Claims**

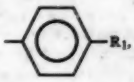


1. A charge-generating material for electrophotography, which comprises a linear high-molecular-weight polymer substituted with a rhodanine derivative having the following structural formula

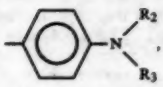


wherein X is a substituent selected from the group consisting of

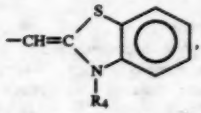
(i)



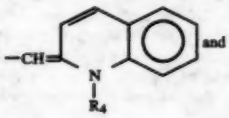
(ii)



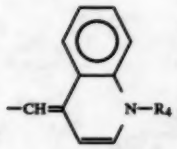
(iii)



(iv)



(v)



in which R_1 stands for a lower alkyl group having up to 6 carbon atoms or a hydroxyl group, R_2 and R_3 stand for a hydrogen atom, a substituted or unsubstituted aryl group or a hydroxyl group, and R_4 stands for a hydrogen atom, a lower alkyl group having up to 6 carbon atoms, a substituted or unsubstituted aryl group or a hydroxyl group, said rhodanine derivative group being present in an amount of 20 to 50% by weight based on the polymer, and said polymer having a weight average molecular weight of about 15,000 to 200,000.

4,965,156

PHOTOSENSITIVE MEMBER HAVING AN OVERCOAT LAYER AND PROCESS FOR MANUFACTURING THE SAME

Hideo Hotomi; Kenji Masaki; Shuji Iino; Izumi Osawa; Masanori Fujiwara, and Isao Doi, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 3, 1989, Ser. No. 318,328

Claims priority, application Japan, Mar. 7, 1988, 63-54190

Int. Cl.[5] G03G 5/14

U.S. Cl. 430—66 **10 Claims**

1. A photosensitive member comprising:

an electrically conductive substrate;

an organic photoconductive layer formed on said electrically conductive substrate and comprising an organic material as a matrix; and

an overcoat layer having first and second overcoat regions and formed on said photoconductive layer, said first overcoat region comprising amorphous carbon which contains fluorine atoms in an amount of about 5 atomic % or more, said second overcoat region formed over said first overcoat region and comprising amorphous carbon which contains fluorine atoms in an amount of less than about 5 atomic % which is less than the amount contained in said first overcoat region, said overcoat layer having a thickness of about 0.01 to about 4.0 microns with said second overcoat region having a thickness of about 10 to about 400 angstroms.

4,965,157

ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR AND POLYOLEFIN DERIVATIVES EMPLOYED IN THE SAME PHOTOCONDUCTOR

Mitsuru Hashimoto; Tomoyuki Shimada, both of Numazu; Nobuo Suzuki, Kouriyama; Takayuki Sakai, Tokyo; Susumu Suzuka, Yono, and Masaomi Sasaki, Susono, all of Japan, assignors to Ricoh Company, Ltd. and Hodogaya Chemical Company, Ltd., both of, Japan

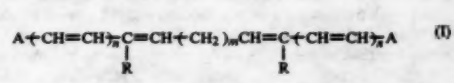
Filed Sep. 16, 1990, Ser. No. 245,288

Claims priority, application Japan, May 27, 1987, 63-131247; Sep. 17, 1987, 62-232895; Sep. 17, 1987, 62-232894; May 27, 1988, 63-131247

Int. Cl.[5] G03G 5/04

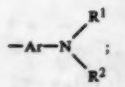
U.S. Cl. 430—80 **6 Claims**

1. An electrophotographic photoconductor comprising an electroconductive support and a photoconductive layer formed thereon comprising at least one polyolefin derivative having the formula (I):



(I)

wherein A represents 9-anthryl group, a substituted or unsubstituted N-substituted c bazolyl group, N-substituted phenothiazinyl group, or



wherein Ar represents a substituted or unsubstituted allylene group, and R^1 and R^2 each represent a substituted or unsubstituted alkyl group, a substituted or unsubstituted aralkyl group or a substituted or unsubstituted aryl group, R represents hydrogen, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aralkyl group or a substituted or unsubstituted aryl group; m is an integer of 2 to 8; and n is an integer of 0 or 1.

4,965,158

TONER COMPOSITIONS WITH MODIFIED CHARGE ENHANCING ADDITIVES

Robert J. Gruber, Pittsford, N.Y.; Raymond A. Yourd, III, Cleveland Heights, Ohio; Paul C. Julien, Webster, N.Y.; Steven B. Bolte, Rochester, N.Y., and John F. Knapp, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

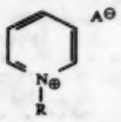
Continuation of Ser. No. 891,836, Aug. 1, 1986, abandoned. This application Dec. 7, 1989, Ser. No. 445,939

Int. Cl.[5] G03G 9/083, 13/22, 9/097

U.S. Cl. 430—106.6 **41 Claims**

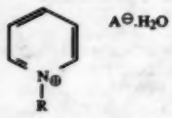
1. An improved toner composition which comprises resin particles, pigment particles, and surface additives comprising a colorless charge enhancing component which is sorbed on a

flow aid composition, this component being selected from the group consisting of alkyl pyridinium halides, organic sulfonate compositions and organic sulfate compositions, of the following formulas:

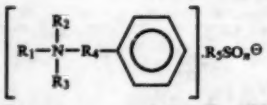


I.

and



wherein R is a hydrocarbon group containing from about 8 to about 22 carbon atoms, and A is an anion, and



II.

wherein R_1 ia an alkyl group containing from about 12 carbon atoms to about 22 carbon atoms, R_2 is an alkyl group with from about 1 carbon atom to about 5 carbon atoms, R_3 is an alkyl group with from about 1 carbon atom to about 5 carbon atoms, R_4 is an alkylene group with from about 1 carbon atom to about 5 carbon atoms, R_5 is a tolyl group or an alkyl group of from about 1 carbon atom to about 3 carbon atoms, and n is the number 3 or 4; and distearyl dimethyl ammonium methyl sulfate, said flow aid being selected from the group consisting of colloidal silicas and aluminum oxides.

6. A toner composition in accordance with claim 1 wherein the pigment is a magnetite.

4,965,159

CARRIER FOR DEVELOPING ELECTROSTATIC IMAGE, AND DEVELOPER FOR DEVELOPING ELECTROSTATIC LATENT IMAGE CONTAINING SAME CARRIER

Shigenori Kohno, Tachikawa, and Kenji Tsujita, Fujino, both of Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 224,098, Jul. 26, 1988, abandoned. This application Feb. 20, 1990, Ser. No. 485,844

Claims priority, application Japan, Jul. 29, 1987, 62-189832; Jul. 29, 1987, 62-189834

Int. Cl.[5] G03G 9/10

U.S. Cl. 430—108 **15 Claims**

1. A carrier for use in a developer for electrophotography, which comprises:

(a) a core material and provided thereon in order,

(b) an intermediate resin layer,

(c) a layer for controlling triboelectric chargeability containing a polymer which contains as a repeating unit a fluorinated alkyl acrylate or fluorinated alkyl methacrylate unit in a proportion by weight not less than 55%,

(d) wherein the content of said polymer in said layer for controlling triboelectric chargeability is not less than 70 weight %, and

(e) wherein the thickness of said intermediate layer is 0.1 to 2.0 μm.

4,965,160

ELECTROPHOTOGRAPHIC DEVELOPER CARRIER PARTICLES COATED WITH BINDER RESIN

Ikutaroh Nagatsuka; Yasuo Matsumura; Masayuki Takeda; Chiaki Suzuki, and Takayoshi Aoki, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 91,146, Aug. 31, 1987, abandoned, which is a continuation-in-part of Ser. No. 58,421, Jun. 5, 1987, Pat. No. 4,791,041. This application Sep. 25, 1989, Ser. No. 412,567

Claims priority, application Japan, Aug. 29, 1986, 61-201577; Aug. 29, 1986, 61-201579

Int. Cl.[5] B32B 9/00; G03G 9/10

U.S. Cl. 430—108 **17 Claims**

1. A developer carrier comprising a core having magnetic particles having an average particle size of not more than about 2 μ dispersed in a binder resin, and having on said core a surface layer containing a fluorine-based compound having a lower critical surface tension than said binder resin,

said binder resin being a thermoplastic resin selected from the group consisting of homopolymers and copolymers comprising at least one monomer selected from a styrene, a monoolefin, a vinyl ester, an ester of an μ-methylene aliphatic monocarboxylic acid, a vinyl ether, and a vinyl ketone and

said fluorine-based compound being fluorinated alkyl acrylate or methacrylate copolymerized with a monomer selected from the group consisting of a styrene monomer, an addition polymerizable unsaturated carboxylic acid, an ester of an addition polymerizable unsaturated carboxylic acid with an alcohol selected from an alkyl alcohol, an alkoxyalkyl alcohol, an aralkyl alcohol, and an alkenyl alcohol, an amide or nitrile derivative of an addition polymerizable unsaturated carboxylic acid, an aliphatic monoolefin, a halogenated aliphalic olefin, a conjugated diene-based aliphatic diolefin, and a nitrogen-containing vinyl monomer.

4,965,161

NON-CROSSLINKED ELECTROGRAPHIC COPOLYMER COMPOSITION AND IMAGING PROCESS

Nargis A. Mahmud, Nashua, N.H., assignor to Nashua Corporation, Nashua, N.H.

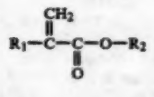
Filed May 31, 1989, Ser. No. 359,405

Int. Cl.[5] G03G 9/087

U.S. Cl. 430—109 **22 Claims**

1. A toner composition for use with an electrographic copying process comprising a mixture of:

(a) a non-crosslinked copolymer prepared from a styrenic monomer, methylmethacrylate, and at least one additional, soft comonomer of the formula:



wherein R_1 is a hydrogen or methyl group, and R_2 comprises an alkyl group having 2–18 carbon atoms;

(b) a colorant; and

(c) a charge control agent,

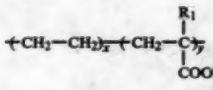
said toner composition having a softening range of between about 50 and about 100 Celsius temperature units between about 60° C. and 170° C.

4,965,162
ELECTROPHOTOGRAPHIC DEVELOPER CONTAINING TIN OXIDE
Shigeo Aonuma, and Koichi Oyamada, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 80,287, Jul. 31, 1987, abandoned. This application Sep. 5, 1989, Ser. No. 403,080
Claims priority, application Japan, Jul. 31, 1986, 61-0178703
Int. Cl.[5] G03G 9/08
U.S. Cl. 430—110 6 Claims

1. An electrophotographic developer containing toner particles comprising a binder resin and a colorant, and tin oxide fine particles composed substantially of SnO_2 or a mixture of SnO_2 and SnO, said fine particles having an electrical resistivity of from 10^5 to 10^8 Ω-cm measured when applying thereto a pressure of 100 kg cm^2.

4,965,163
LIQUID DEVELOPER FOR ELECTROSTATIC IMAGE
Nobuo Suzuki; Yutaka Sakasai, and Tetuo Usui, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 24, 1989, Ser. No. 315,064
Claims priority, application Japan, Feb. 24, 1988, 63-41272; Feb. 24, 1988, 63-41273
Int. Cl.[5] G03G 9/13
U.S. Cl. 430—114 10 Claims

1. A liquid developer for electrostatic images comprising a carrier liquid containing at least one copolymer represented by the following general formula (I):


(I)

wherein R_1 represents a hydrogen atom or a methyl group; R_2 represents an alkyl group, an aralkyl group, an aryl group or a cycloalkyl group, which may be substituted; and x and y each represents a number to satisfy the condition of x/y=0.995 to 0.80/0.005 to 0.20 on a molar basis.

4,965,164
METHOD FOR PRODUCING ELECTROPHOTOGRAPHIC PHOTORECEPTOR
Yuzuru Fukuda, and Masayuki Nishikawa, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed Feb. 7, 1989, Ser. No. 306,979
Claims priority, application Japan, Feb. 10, 1988, 63-27422
Int. Cl.[5] G03G 5/082
U.S. Cl. 430—128 9 Claims

1. A method for producing an electrophotographic photoreceptor which comprises the steps of (1) forming a charge transporting layer comprising aluminum oxide on a substrate and then forming thereon a charge generating layer comprising mainly amorphous silicon, or alternatively (2) forming a charge generating layer comprising mainly amorphous silicon on a substrate and then forming thereon a charge transporting layer comprising aluminum oxide, wherein said charge transporting layer is formed using an aluminum or a compound containing aluminum by the ion plating method while maintaining the substrate at 50° C. or more.

4,965,165
DONOR MEDIA SHELF LIFE STABILIZATION BY CONTROL OF EXPOSURE TO CONTACTING OXYGEN AND MOISTURE
Edward J. Saccocio, Bellbrook; Uday Varde, Spring Valley; David A. Hutchings, Centerville, and Russell K. Messer, Kettering, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio
Filed May 30, 1989, Ser. No. 359,069
Int. Cl.[5] G03C 1/72
U.S. Cl. 430—138 8 Claims

1. A method for storing photosensitive donor media including a support having a layer of photosensitive microcapsules on the surface comprising the steps of:

placing said donor media in an air and humidity occlusive vessel; establishing an internal atmosphere in said vessel, said internal atmosphere containing about 1 to 5% oxygen and about 40 to 60% humidity; and sealing said donor media in said vessel.

4,965,166
MULTICOLOR RECORDING MATERIAL
Noriyuki Hosoi, and Toshimasa Usami, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Mar. 2, 1989, Ser. No. 318,218
Claims priority, application Japan, Mar. 2, 1988, 63-47517; Apr. 25, 1988, 63-103630; May 11, 1988, 63-115601; May 23, 1988, 63-126590; May 30, 1988, 63-132169
Int. Cl.[5] G03C 1/52, 5/18
U.S. Cl. 430—156 13 Claims

1. A multicolor recording material which comprises a support having on one side thereof at least two color-producing recording layers capable of producing colors different from each other in hue through corresponding color-producing reactions, every adjacent two of said color-producing recording layers having therebetween an interlayer comprising of a water-soluble polyanionic polymer having gelled through the interaction with polycation.

4,965,167
POSITIVE-WORKING PHOTORESIST EMPLOYING A SELECTED MIXTURE OF ETHYL LACTATE AND ETHYL 3-ETHOXY PROPIONATE AS CASTING SOLVENT
Thomas E. Salamy, North Kingstown, R.I., assignor to Olin Hunt Specialty Products, Inc., Cheshire, Conn.
Filed Nov. 10, 1988, Ser. No. 269,521
Int. Cl.[5] G03C 1/60; G03F 7/022
U.S. Cl. 430—191 13 Claims

1. A light-sensitive composition useful as positive-working photoresist comprising an admixture of:

(a) at least one alkali-soluble binder resin;

(b) at least one photoactive compound;

(c) a sufficient amount of a solvent mixture comprising ethyl lactate and ethyl 3-ethoxy propionate to dissolve (a) and (b);

wherein the amount of said binder resin is from about 60% to 95% by weight, the amount of said photoactive compound is from about 5% to about 40% by weight, both based on the total solids content of said light-sensitive composition, and wherein the weight ratio of ethyl lactate to ethyl 3-ethoxy propionate is from about 30:70 to about 80:20.

4,965,168

SILVER MASTER PLATE RECOVERY SOLUTION

Hajime Yoshida, Aichi; Tokuichi Kamada, Ichinomiya, and Osamu Kainuma, Nagoya, all of Japan, assignors to Nikken Chemical Laboratory Co., Ltd., Nagoya, Japan

Filed Jan. 2, 1989, Ser. No. 361,659

Claims priority, application Japan, Jan. 9, 1988, 63-142577

Int. Cl.[5] G03C 5/54

U.S. Cl. 430—204 14 Claims

1. A silver master plate recovery solution for recovering the ink receptivity of an image area on a silver salt photographic plate for offset printing by reducing the silver oxide layer of said image area, said silver master plate recovery solution comprising:

(a) a hydrazine component for reducing said silver oxide layer of said image area;

(b) a quaternary ammonium salt cationic activator which enters the minute pores on said image area to lower the polarity of said image area which had been made porous by said hydrazine component; and

(c) water.

4,965,169

METHOD FOR FORMING A HIGH CONTRAST NEGATIVE IMAGE

Mitsunori Hirano; Masato Hirano; Morio Yagihara, and Hisashi Okada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 7, 1988, Ser. No. 268,126

Claims priority, application Japan, Nov. 6, 1987, 62-280466

Int. Cl.[5] G03C 1/06, 5/24

U.S. Cl. 430—264 21 Claims

1. A method for forming a high contrast negative image comprising the steps of:

(a) imagewise exposing a silver halide photographic material comprising a support having thereon at least one light sensitive silver halide emulsion layer, said emulsion layer or other hydrophilic colloid layer containing at least one hydrazine derivative; and

(b) developing said exposed silver halide photographic material in a developer solution containing:

(1) a dihydroxybenzene developing agent;

(2) at least one auxiliary developing agent selected from a 1-phenyl-3-pyrazolidone auxiliary developing agent and a p-aminophenol auxiliary developing agent;

(3) at least 0.3 mol per liter of a sulfite; and

(4) at least one compound represented by formula (I):

$$Y\text{-}(A)_n\text{-}B)_m \qquad (I)$$

wherein Y represents a group capable of adsorbing to silver halide; A represents a divalent linking group; B represents an amino group, an ammonium group or a nitrogen containing heterocyclic group; m is 1, 2 or 3; and n is 0 or 1; to form a high contrast negative image.

4,965,170

SILVER HALIDE PHOTOGRAPHIC MATERIAL AND METHOD FOR FORMING SUPER HIGH CONTRAST IMAGES THEREWITH

Toshinao Ukai; Kazuhiro Shirasu; Koki Nakamura; Keizo Koya; Masahiro Okada, and Kazunobu Katoh, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 160,970, Feb. 26, 1988, abandoned. This application Mar. 6, 1990, Ser. No. 489,872

Claims priority, application Japan, Feb. 26, 1987, 62-43704; May 28, 1987, 62-133014

Int. Cl.[5] G03C 1/10

U.S. Cl. 430—264 18 Claims

1. A silver halide photographic material comprising a support having thereon at least one silver halide emulsion layer and at least one hydrophilic colloid layer which contains a compound represented by formula (I):

$$PWR\text{—}(Time)_tLA \qquad (I)$$

wherein PWR represents a group which undergoes reduction to release $(Time)_tLA$; Time represents a group which releases LA upon reaction following release of $(Time)_tLA$ from PWR; t represents an integer of 0 or 1; and LA represents a group having a maximum light absorption in a wavelength range of 310 nm or more, said material having a hydrophilic colloid layer substantially free of the compound represented by formula (I) provided between said hydrophilic colloid layer containing the compound represented by formula (I) and said at least one silver halide emulsion layer, wherein said silver halide emulsion layer contains a high contrast imparting hydrazine derivative.

4,965,171

PHOTOPOLYMERIZABLE COMPOSITION

Masami Kawabata, Takatsuki; Masahiko Harada, Suita, and Yasuyuki Takimoto, Takatsuki, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Division of Ser. No. 147,343, Jan. 22, 1988, Pat. No. 4,868,092. This application May 18, 1989, Ser. No. 353,819

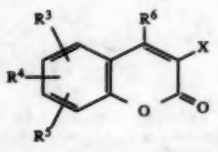
Claims priority, application Japan, Jan. 22, 1987, 62-14458; May 11, 1987, 62-113894

Int. Cl.[5] G03C 1/73

U.S. Cl. 430—288 9 Claims

1. A photopolymerizable composition comprising a polymerizable compound having an ethylenically unsaturated double bond and a photopolymerization initiator wherein the photopolymerization initiator comprises:

A coumarin dyestuff having the following formula;



[III]

wherein X represents a hydrogen atom, a cyano group or —CO—(—CH=CH—)n—R^7, wherein n is an integer of 0 to 2 and R^7 represents a hydroxyl group, a substituted or unsubstituted alkyl group having 1 to 10 carbon atoms, a substituted or unsubstituted alkoxy group having 1 to 10 carbon atoms, a substituted or unsubstituted aryl group having 6 to 12 carbon atoms, a substituted or unsubstituted aryloxy group having 6 to 12 carbon atoms or substituted or unsubstituted heterocyclic ring in which the total number of carbon atoms and herero atoms is 5 to 15, R^3, R^4 and R^5 respectively represent a hydrogen atom, an alkoxy group having 1 to 6 carbon atoms, an amino group, an alkyl-or dialkyl-amino group having 1 to 8 carbon atoms, a hydroxyl group, a halogen atom, a nitro group, a 5 to 6-membered heterocyclic ring, a substituted or unsubstituted arylazo group having 6 to 12 carbon atoms, or R^3 and R^4 and R^5 together represents a condensed ring or condensed hetero ring having 5 to 10 carbon atoms, and R^6 represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an aryl group having 6 to 12 carbon atoms or a trihalomethyl group,

a diaryliodonium salt, and

a compound selected from the group consisting of triethylamine, N-methylethanolamine, triethanolamine, N-ethyl-N-benzylaniline, N,N-diethyl-p-phenylenediamine, N-phenylglycine, or a mixture thereof thiophenoxyacetic acid and o-chlorothiophenoxyacetic acid.

6. The composition of claim 1 wherein the polymerizable

compound has two ethylenically unsaturated bonds in one molecule.

4,965,172

HUMIDITY-RESISTANT PROOFING TONERS WITH LOW MOLECULAR WEIGHT POLYSTYRENE

Howard Matrick, Highlands, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1988, Ser. No. 289,848
Int. Cl.[5] G03C 5/00; C08F 12/12
U.S. Cl. 430—291 15 Claims

1. In a method for color development of a surface having imagewise tacky and nontacky image areas which comprises

(a) applying a dry nonelectroscopic toner to the image-bearing surface;

(b) distributing the toner particles over the image surface whereby the distributed toner particles become embedded solely in the tacky image areas; and

(c) physically removing toner particles from the non-tacky areas which are left substantially free of the toner particles, the improvement wherein images having higher toned optical density with improved color purity are obtained using a dry nonelectroscopic humidity resistant toner having a size distribution within the range from about 0.2 micron to about 10 microns, not more than 10% of the toner being below about 0.5 micron and not more than 10% of the toner being above 5 microns, and the toner consists essentially of a colorant dispersed in an organic resin wherein the resin is a single homogeneous polymer selected from the group consisting of homopolymers of styrene or styrene homologs, and interpolymers thereof, said polymer having a number average molecular weight in the range from about 500 to about 2,000, and said polymer having a softening temperature in the range from about 75° C. to about 175° C.

8. A dry nonelectroscopic, humidity resistant toner for producing images having higher toned optical density with improved color purity, said toner having a size distribution within the range from about 0.2 micron to about 10 microns, and not more than 10% of the toner being below about 0.5 micron and not more than 10% of the toner being above 5 microns, and which comprises a colorant dispersed in an organic resin wherein the resin is a single homogeneous polymer selected from the group consisting of homopolymers of styrene or styrene homologs, and interpolymers thereof, said polymer having a number average molecular weight in the range from about 500 to about 2,000,and said polymer having a softening temperature in the range from about 75° C. to about 175° C.

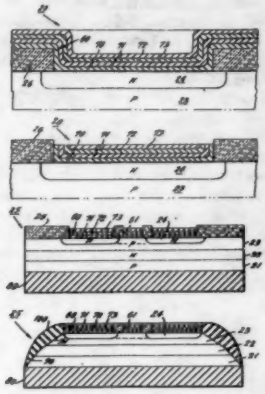
4,965,173

METALLIZING PROCESS AND STRUCTURE FOR SEMICONDUCTOR DEVICES

Herbert J. Gould, Sherman Oaks, Calif., assignor to International Rectifier Corporation, El Segundo, Calif.

Division of Ser. No. 447,761, Dec. 8, 1982, abandoned. This application Jun. 20, 1988, Ser. No. 209,296
The portion of the term of this patent subsequent to May 12, 2004, has been disclaimed.
Int. Cl.[5] G03C 5/00
U.S. Cl. 430—317 48 Claims

1. The method of metallizing a surface portion of a monocrystalline silicon wafer comprising the steps of removing at least a one micron thickness from said surface portion to ensure removal of unintended oxygen contamination in said surface portion; depositing a thin layer of nickel onto said surface portion and converting at least a portion of the thickness of said nickel layer to nickel silicide; and depositing at least a layer of a contact metal into electrical contact with said fixed



relative to said thin layer of nickel and being strongly surface portion.

4,965,174

RECORDING MEDIUM AND PROCESS FOR FORMING COLOR IMAGE WITH USE OF THE SAME

Ryuichi Arai, Sagamihara; Masahiro Haruta, Tokyo; Nobuko Yamamoto, Isehara; Tetsuya Yano, Atsugi; Hiroyoshi Kishi, Atsugi, and Masanori Sakuranaga, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 105,211, Oct. 7, 1987, abandoned. This application Oct. 24, 1989, Ser. No. 447,066
Claims priority, application Japan, Oct. 8, 1986, 61-238142; Mar. 20, 1987, 62-064044
Int. Cl.[5] G03C 7/00, 1/73
U.S. Cl. 430—340 24 Claims

1. A recording medium including a recording layer comprising a mosaic-like set of image-forming units, each image-forming unit comprising a first region containing a bacteriorhodopsin or derivative thereof and a second region containing a color-former responsive to change in hydrogen ion concentration where the bacteriorhodopsins or derivatives thereof contained in each unit have a photosensitive wavelength selected from a plurality of wavelengths.

4,965,175

METHOD FOR PROCESSING A SILVER HALIDE PHOTOSENSITIVE MATERIAL FOR COLOR PHOTOGRAPHY

Hiroshi Fujimoto, and Kazuaki Yoshida, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 3, 1989, Ser. No. 416,556
Claims priority, application Japan, Oct. 3, 1988, 63-249236
Int. Cl.[5] G03C 7/30
U.S. Cl. 430—375 13 Claims

1. A method for continuous processing of a silver halide color photosensitive material which comprises developing a color photographic light-sensitive material comprising a support having thereon at least one light-sensitive silver halide emulsion layer containing a silver halide comprising at least 80 mol % silver chloride, concentration of from 3.5×10^{-2} to 2.0×10^{-1} mol/l, said developing step being conducted in a developer bath having a bath opening ratio (S/V) of at most 0.015 cm^{-1} wherein S is the air-contacting area of the bath in cm^2 and V is the total volume of the bath in cm^3.

4,965,176

METHOD FOR PROCESSING LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Masao Ishikawa, and Satoru Kuse, both of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Aug. 30, 1988, Ser. No. 238,755
Claims priority, application Japan, Sep. 2, 1987, 62-220061; Sep. 10, 1987, 62-227709
Int. Cl.[5] G03C 1/485, 5/24, 7/30
U.S. Cl. 430—378 18 Claims

1. A method for processing a light-sensitive silver halide color photographic material, characterized in that said light-sensitive silver halide color photographic material contains a core-shell type-internal latent image type silver halide emulsion, a shell of which contains at least silver chloride, and said light-sensitive silver halide color photographic material is processed with a color developing solution containing the compound represented by the following formula (A):

(A)

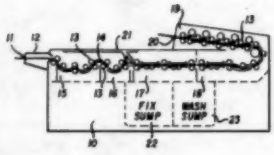
wherein R_1 and R_2 each represent a hydrogen atom or an alkyl group having 1 to 5 carbon atoms which may have a substituent or substituents, or R_1 and R_2 may be combined to form a ring, provided that the case where R_1 and R_2 are hydrogen atoms at the same time is excluded.

4,965,177

ACTIVATOR SOLUTION WITH COLD IMAGE TONE-PROVIDING AGENT

Donald F. McLaen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 2, 1989, Ser. No. 388,412
Int. Cl.[5] C03C 5/29
U.S. Cl. 430—405 3 Claims



1. A process for improving the image tone of a large number of black-and-white photographic prints made by an automated processor employing (a) the activation process to prepare said prints from activator incorporated, resin-coated photographic paper and (b) a batch of processing chemicals;

said process comprising activating said paper at the activate section of said processor with an alkaline activator containing from about 1.0 to about 8.0 grams per liter of an alkali metal iodide.

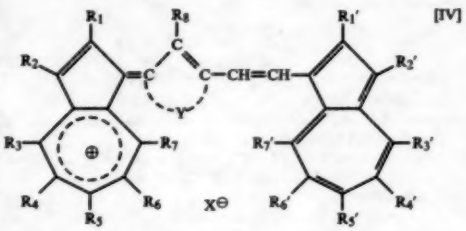
4,965,178

OPTICAL RECORDING MEDIUM

Tsuyoshi Santoh, Yokohama, and Chieko Hioki, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1988, Ser. No. 241,845
Claims priority, application Japan, Sep. 12, 1987, 62-228992; Sep. 12, 1987, 62-228994; Oct. 12, 1987, 62-256767
Int. Cl.[5] G11B 7/24, 11/03; G03C 1/73
U.S. Cl. 430—495 17 Claims

1. An optical recording medium comprising a recording layer containing at least one compound selected from the group consisting of azulenium salt compounds represented respectively by Formulae, (II), (III) and (IV) shown below:



[IV]

wherein R_1 to R_{12} and R'_1 to R'_7 each represent a hydrogen atom, a halogen atom or a substituent that is a monovalent organic residual group: among combinations of R_1 with R'_1, R_2 with R'_2, R_3 with R'_3, R_4 with R'_4, R_5 with R'_5, R_6 with R'_6 and R_7 with R'_7, at least one combination comprises a combination of different substituents; $X^{\oplus}$ represents an anion residual group, and Y represents a divalent hydrocarbon group that forms a substituted or unsubstituted ring of 5 members, 6 members or 7 members: and any one combination among combinations of R_1 with R_2, R_2 with R_3, R_3 with R_4, R_4 with R_5, R_5 with R_6, R_6 with R_7, R'_1 with R'_2, R'_2 with R'_3, R'_3 with R'_4, R'_4 with R'_5, R'_5 with R'_6 and R'_6 with R'_7 may form a substituted or unsubstituted condensed ring.

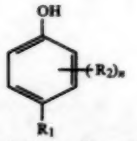
4,965,179

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Shigeru Kuwashima, and Akio Mitsui, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 853,828, Apr. 21, 1986, abandoned.
This application Dec. 27, 1988, Ser. No. 289,536
Claims priority, application Japan, Apr. 19, 1985, 60-83668
Int. Cl.[5] G03C 1/46, 7/396
U.S. Cl. 430—504 18 Claims

1. A silver halide color photographic material for negative development comprising a support having thereon at least three silver halide emulsion layer units each having a sensitivity to each of three primary colors of blue, green and red, wherein at least one unit among said silver halide emulsion layer units comprises a blue sensitive or green sensitive layer group containing at least two layers each having a different sensitivity and at least the lowest sensitive layer in said layer group contains at least one compound of the general formula (I):



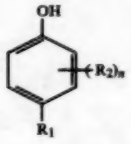
(I)

wherein R_1 is a linear, branched or cyclic alkyl group having 1 to 20 carbon atoms, a linear, branched or cyclic alkoxy group having 1 I to 20 carbon atoms, or such a linear, branched or cyclic alkyl group or linear, branched or cyclic alkoxy group substituted with a chlorine atom, a hydroxy group, an alkoxycarbonyl group, an acyl group, or an acylamino group; R_2 is a hydrogen atom, a halogen atom or a substituent as defined in said R_1; n is an integer of 1 to 4, and when n is 2 or more, said R_2's may be the same or different substituents; with the proviso that the total carbon number in said R_1 and R_2 is 50 or less; dispersed in said layer together with a coupler, wherein the relation of the color maximum absorption wavelength λ_{max}(LD_{max}) shown by the layer which is the lowest sensitive layer in said layer group to at least one coloring maximum

absorption wavelength $\lambda_{max}(L_x)$ shown by a layer in said layer group having the same color sensitivity as that of the lowest sensitive layer, but which is a layer other than said lowest sensitive layer satisfies the following condition (C)

$$\lambda_{max}(LD_{max})-\lambda_{max}(L_x)\geqq 5 \text{ nm} \quad (C).$$

10. A silver halide color photographic material for reversal development comprising a support having thereon at least three silver halide emulsion layer units each having a sensitivity to each of three primary colors of blue, green and red, wherein at least one unit among said silver halide emulsion layer units comprises a blue sensitive or green sensitive layer group containing at least two layers each having a different sensitivity and at least the highest sensitivity layer in said layer group contains at least one compound of the general formula (I):


(I)

wherein R_1 is a linear, branched or cyclic alkyl group having 1 to 20 carbon atoms, a linear, branched or cyclic alkoxy group having 1 to 20 carbon atoms, or such a linear, branched or cyclic alkyl group or linear, branched or cyclic alkoxy group substituted with a chlorine atom, a hydroxy group, an alkoxycarbonyl group, an acyl group, or an acylamino group; R_2 is a hydrogen atom, a halogen atom or a substituent as defined in said R_1; n is an integer of 1 to 4, and when n is 2 or more, said R_2's may be the same or different substituents; with the proviso that the total carbon number in said R_1 and R_2 is 50 or less; dispersed in said layer together with a coupler,

wherein the relation of the coloring maximum absorption wavelength $\lambda_{max}(LD_{max})$ shown by the layer which is the highest sensitivity layer in said layer group to at least one coloring maximum absorption wavelength $\lambda_{max}(L_x)$ shown by a layer in said layer group having the same color sensitivity as that of the highest sensitive layer, but which is a layer other than said highest sensitive layer satisfies the following condition (C):

$$\lambda_{max}(LD_{max})-\lambda_{max}(L_x)\geqq 5 \text{ nm} \quad (C).$$

4,965,180

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Koichi Suematsu, Shizuoka; Sumito Yamada, Kanagawa; Tomokazu Yasuda, Kanagawa; Junichi Yamanouchi, Kanagawa, and Yasuo Mukunoki, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

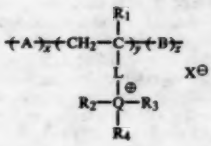
Filed Dec. 21, 1988, Ser. No. 287,292

Claims priority, application Japan, Dec. 22, 1987, 62-324575

Int. Cl.[5] G03C *1/80*

U.S. Cl. 430—518 **20 Claims**

1. A silver halide photographic material which comprises a support having thereon at least one silver halide emulsion layer and a subbing layer arranged between the support and said at least one silver halide emulsion layer containing an aqueous polymer latex represented by the following formula (I), which has a cross linked structure:


(I)

wherein A represents an ethylenic unsaturated monomer unit; R_1 represents a hydrogen atom or a lower alkyl group having from 1 to 6 carbon atoms; L represents a divalent group having from 1 to 12 carbon atoms; R_2, R_3 and R_4, which may be the same or different, each represents an alkyl group, an aralkyl group or a hydrogen atom; Q represents nitrogen or phosphorus; $X^{\ominus}$ represents an anion other than iodine ion; and B represents a structural unit in which copolymerizable monomers having at least two ethylenic unsaturated groups have been copolymerized; x is selected to constitute from 0 to 90 mol %; y is selected to constitute from 10 to 99.9 mol %; z is selected to constitute from 1.0 to 50 mol %; and R_2, R_3 and R_4 may be linked together to form, together with Q, a cyclic structure;

and wherein said subbing layer comprises a coating liquid containing a nonionic surfactant in an amount of at least 0.05 gram per liter.

4,965,181

HEAT-DEVELOPABLE LIGHT-SENSITIVE MATERIAL COMPRISING A SENSITIZING DYE

Seiiti Kubodera; Akihiko Ikegawa, and Masaki Okazaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

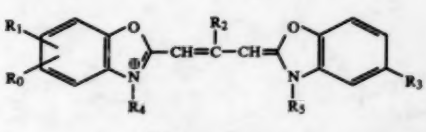
Continuation of Ser. No. 127,143, Dec. 1, 1987, abandoned. This application Feb. 28, 1990, Ser. No. 492,266

Claims priority, application Japan, Dec. 1, 1986, 61-286424

Int. Cl.[5] G03C *1/19, 1/28, 1/40*

U.S. Cl. 430—550 **21 Claims**

1. A heat-developable light-sensitive material comprising a support having provided thereon a light-sensitive layer comprising a silver halide which is spectrally sensitized with at least one dye represented by the formula (I):


(I)

$(X)_n$

wherein R_0 and R_1, which may be the same or different, each represents a hydrogen atom, an alkyl group, an aryl group, an alkoxy group, an aryloxy group, a halogen atom, an alkoxycarbonyl group, an acylamino group, an acyl group, a cyano group, a carbamoyl group, a sulfamoyl group, a carboxyl group, or an acyloxy group; provided that at least one of R_0 and R_1 represents a group other than a hydrogen atom; R_2 represents a hydrogen atom, an alkyl group, or an aryl group; R_3 represents an alkyl group containing at least two carbon atoms, an acyloxy group containing at least three carbon atoms, or an alkoxycarbonyl group containing at least four carbon atoms: the group represented by R_3 has a value of S of 544 or less wherein S is represented by formula (Z):

$$S=3.536L-2.661B+535.4 \quad (Z)$$

wherein L represents the length of the group R_3 along the axis of the bond between the group R_3 and the center of the ben-

zene nucleus to which the group R_3 is connected, and B represents the smaller value of B_1+B_4 and B_2+B_3 wherein B_1, B_2, B_3, and B_4 each represents the width of the group R_3 which are measured at their maximum points and perpendicular to said axis and each other, provided that R_1 is the smallest value and R_2, R_3, and R_4 are successively larger; R_4 and R_5, which may be the same or different, each represents an alkyl group; X represents an anion; and n is 0 or 1, as required to satisfy charge balance, wherein said heat-developable light-sensitive material contains a dye providing substance represented by formula (LI): Dye-X_n-Y; and a reducing substance, with the proviso that said reducing substance may be said dye providing substance when said dye providing substance has reducing ability, and wherein in said general formula (LI) Dye represents a dye moiety, a dye moiety in which the absorption wavelength is temporarily shifted to the short wavelength region, or a dye precursor group; X represents a bond or linking group; Y represents a group which alters the diffusibility of the compound represented by general formula (LI) corresponding to or counter-corresponding to a light-sensitive silver salt having a latent image or a group which releases Dye and provides a difference in diffusibility between the released Dye and (Dye-X)$_n$-Y, and n is 1 or 2, and when n is 2, the two Dye-X moieties may be the same or different.

4,965,182

SILVER HALIDE PHOTOGRAPHIC EMULSION CONTAINING INFRARED SENSITIZING DYES AND SUPERSENSITIZING COMPOUNDS

Yuji Mihara, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

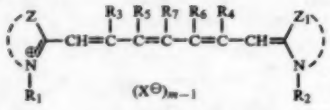
Continuation of Ser. No. 64,471, Jun. 22, 1987, abandoned. This application Jun. 29, 1989, Ser. No. 373,638

Claims priority, application Japan, Jun. 20, 1986, 61-142813; Jun. 20, 1986, 61-142814

Int. Cl.[5] G03C *1/28*

U.S. Cl. 430—576 **8 Claims**

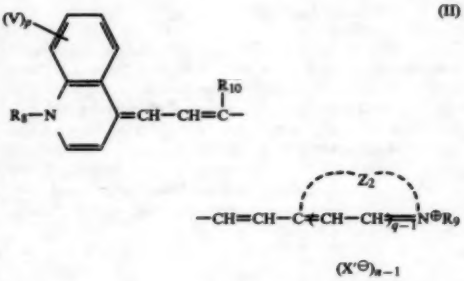
1. A silver halide photographic emulsion comprising a silver halide, at least one infrared sensitizing dye represented by the following general formula (I) or (II), and at least one supersensitizing compound represented by the following general formula (IIIa) or (IIIb): 0



(I)

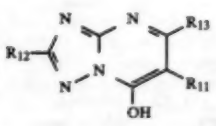
wherein, R_1 and R_2, which may be the same or different, each represents an alkyl group or a substituted alkyl group; R_3 and R_4, which may be the same or different, each represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, a phenyl group, or a benzyl group; R_5 and R_6 both represent a hydrogen atom or are bonded to form a divalent alkylene group; R_7 represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, a phenyl group, a benzyl group, or

wherein, W_1 and W_2, which may be the same or different, each represents a substituted or unsubstituted alkyl group or a substituted or unsubstituted aryl group, provided that said W_1 and W_2 may be bonded to form a 5-membered or 6-membered nitrogen-containing heterocyclic ring; or said R_3 and R_7 may be bonded to form a divalent alkylene group; Z and Z_1, which may be the same or different, each represents a non-metallic atomic group necessary for forming a 5-membered or 6-membered nitrogen-containing heterocyclic ring; $X^{\ominus}$ represents an acid anion; and m represents 1 or 2;

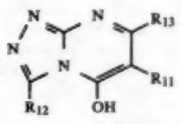


(II)

wherein, R_8 and R_9, which may be the same or different, each represents an alkyl group or a substituted alkyl group; R_{10} represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, a phenyl group, or a benzyl group; V represents a hydrogen atom, a lower alkyl group, an alkoxy group, a halogen atom, or a substituted alkyl group; Z_2 represents a non-metallic atomic group necessary for forming a 5-membered or 6-membered nitrogen-containing heterocyclic ring; $X'^{\ominus}$ represents an acid anion; and n, p, and q, which may be the same or different, each represents 1 or 2;

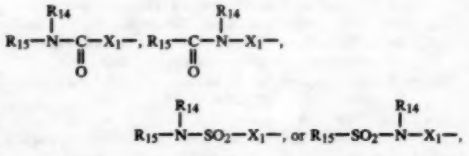


(IIIa)



(IIIb)

wherein, R_{11} and R_{12} each represents a hydrogen atom, a lower alkyl group, an alkenyl group, a carboxy group, an alkoxy group, or a halogen atom; and R_{13} represents an alkyl group having at least 5 carbon atoms, an aralkyl group, an aryl group, an alkylthio group, an arylthio group, an alkoxy group having at least 3 carbon atoms, an aryloxy group, an alkylamino group having at least 3 carbon atoms, an arylamino group,



wherein, X_1 represents a divalent linkage group, and R_{14} and R_{15}, which may be the same or different, each represents a hydrogen atom, an alkyl group, an alkenyl group, an aralkyl group, an aryl group, or a heterocyclic group.

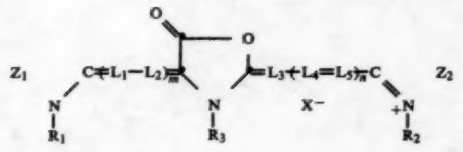
4,965,183

TRI-NUCLEAR DYES FOR PHOTOGRAPHIC COMPOSITIONS AND METHOD OF PREPARTION

John D. Mee, and Jal F. Munshi, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 5, 1988, Ser. No. 253,835
Int. Cl.[5] G03C 1/26
U.S. Cl. 430—578 10 Claims

1. A photographic element comprising a support having thereon a layer comprising a silver halide emulsion wherein the silver halide is spectrally sensitized with a dye having the formula:



wherein

R_1, R_2, and R_3 are each independently substituted or unsubstituted alkyl or substituted or unsubstituted aryl,

L_1, L_2, L_3, L_4, and L_5 are each independently substituted or unsubstituted methine groups,

Z_1 and Z_2 each independently represents the atoms necessary to complete a substituted or unsubstituted 5- or 6-membered heterocyclic ring structure,

m and n are each independently 0, 1, or 2, and

X is an anion or an anionic group on the compound to form an intramolecular salt.

4,965,184

SILVER HALIDE EMULSIONS WITH IMPROVED SPEED

Raymond J. LeStrange, Hendersonville, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 23, 1989, Ser. No. 314,199
Int. Cl.[5] G03C 1/08
U.S. Cl. 430—603 7 Claims

1. In a process for formation of a sensitized photosensitive element with at least one photosensitive silver halide emulsion containing a sensitizer wherein the improvement comprises introducing into said emulsion in addition to the sensitizer a sensitizing amount of an alkali metal salt of 1-naphthol-4-sulphonic acid in a concentration of from 1 to 20 grams per 1.5 mole of silver halide whereby the emulsion has increased sensitivity resulting in an increase in speed.

4,965,185

METHOD FOR LOW-TEMPERATURE PRESERVATION OF EMBRYOS

Valentin I. Grischenko, ulitsa Pushkinskaya, 67/69, kv. 31; Jury V. Kalugin, ulitsa Krasnoznamennaya, 6, kv. 24; Nina A. Luchko, ulitsa Dokuchaeva, 34, and Elena N. Chernysh, ulitsa Chkalova, 13, kv. 26, all of Kharkov, U.S.S.R.

Filed Jun. 21, 1988, Ser. No. 209,632
Int. Cl.[5] A01N 1/02
U.S. Cl. 435—1 7 Claims

1. A method for cooling embryos to the temperature of a refrigerant in which they are to be stored comprising:

adding said embryos to a buffer-salt medium; said buffer-salt medium comprising a mixture of cryoprotectors, said cryoprotectors selected from the group consisting of glycerol, dimethylsulphoxide and a dihdric alcohol; placing said embryos in said buffer-salt medium into a container made of food packing foil; introducing said container with said embryos into a thermal diffusive powdered material; said powdered material having been cooled to the temperature of the refrigerant; said powdered material being a metal

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4,965,186

METHOD FOR LOW-TEMPERATURE PRESERVATION OF SPERMATOZOA

Valentin I. Grischenko, ulitsa Pushkinskaya, 67/69, kv. 31; Jury V. Kalugin, ulitsa Krasnoznamennaya, 6, kv. 24; Jury S. Paraschuk, ulitsa Pushkinskaya, 67/69, kv. 30; Nina A. Luchko, ulitsa Dokuchaeva, 34; Elena N. Chernysh, ulitsa Chkalova, 13, kv. 26; Valery F. Tarasov, ulitsa S. Esenina, 19, kv. 40, and Sergei E. Galchenko, ulitsa Korchagintsev, 36, kv. 17, all of Kharkov, U.S.S.R.

Filed Jun. 21, 1988, Ser. No. 209,574
Int. Cl.[5] A01N 1/02
U.S. Cl. 435—2 5 Claims

1. A method for cooling spermatozoa to the temperature of a refrigerant in which they are to be stored comprising:

adding said spermatozoa to a cryopreservative; said cryopreservative comprising a salt buffer, an antishock component, and a cryoprotector,

placing said spermatozoa in said cryopreservative into a container made of food packing foil;

introducing said container with said spermatozoa into a thermal diffusive powdered material;

said powdered material having been cooled to the temperature of the refrigerant;

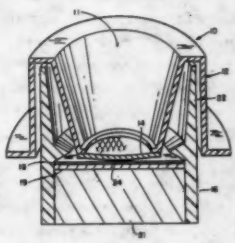
said powdered material being alumina (Al_2O_3).

4,965,187

METHOD AND APPARATUS FOR ASSAYING WHOLE BLOOD

Quentin J. Tonelli, Portland, Me., assignor to Idexx Corporation, Portland, Me.

Division of Ser. No. 905,856, Sep. 10, 1986, Pat. No. 4,939,096.
This application Mar. 21, 1989, Ser. No. 326,888
The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.
Int. Cl.[5] C12Q 1/70
U.S. Cl. 435—5 14 Claims



1. A kit for assaying a sample of whole blood for one member of a specific binding pair, said kit comprising a first container holding a hypertonic solution, a second container suitable for containing a mixture of said hypertonic solution from said first container with the sample, a filter having a porosity to permit said mixture of said sample and said hypertonic solution to pass from said second container through said filter, said filter being capable of retaining the red blood cells in said sample, means for collecting the filtrate containing the first member of the binding pair, and means for detecting said one member of a specific binding pair with the second member of the binding pair.

4,965,188

PROCESS FOR AMPLIFYING, DETECTING, AND/OR CLONING NUCLEIC ACID SEQUENCES USING A THERMOSTABLE ENZYME

Kary B. Mullis, La Jolla; Henry A. Erlich; David H. Gelfand, both of Oakland; Glenn Horn, Emeryville, and Randall K. Saiki, Richmond, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 899,513, Aug. 22, 1986, abandoned, which is a continuation-in-part of Ser. No. 839,331, Mar. 13, 1986, abandoned, and a continuation-in-part of Ser. No. 828,144, Feb. 7, 1986, Pat. No. 4,683,195, which is a continuation-in-part of Ser. No. 824,044, Jan. 30, 1986, abandoned, which is a division of Ser. No. 791,308, Oct. 25, 1985, Pat. No. 4,683,202, which is a continuation-in-part of Ser. No. 716,975, Mar. 28, 1985, abandoned. This application Jun. 17, 1987, Ser. No. 63,647

The portion of the term of this patent subsequent to Jul. 28, 2004, has been disclaimed.

Int. Cl.[5] C12Q *1/68*; C12P *21/00, 19/34*; C12N *15/00*

U.S. Cl. 435—6 **50 Claims**

1. A process for amplifying at least one specific DNA sequence contained in a DNA or a mixture of nucleic acids, wherein if the DNA is double-stranded, it consists of two separated complementary strands of equal or unequal length, which process comprises:

(a) contacting the DNA with four different nucleoside triphosphates and two oligonucleotide primers, for each different specific sequence being amplified, wherein each primer is selected to be sufficiently complementary to different strands of each specific sequence to hybridize therewith, such that the extension product synthesized from one primer, when separated from its complement, can serve as a template for synthesis of the extension product of the other primer, at a temperature which promotes hybridization of each primer to its complementary strand;

(b) contacting each strand, at the same time as or after step (a), with thermostable enzyme which catalyzes combination of the nucleoside triphosphates to form primer extension products complementary to each strand of DNA;

(c) maintaining the mixture from step (b) at an effective temperature for an effective time to promote the activity of the enzyme, and to synthesize, for each different sequence being amplified, an extension product of each primer which is complementary to each strand, but not so high as to separate each extension product from its complementary strand;

(d) heating the mixture from step (c) for an effective time and at an effective temperature to separate the primer extension products from the strands on which they were synthesized to produce single-stranded molecules, but not so high as to denature irreversibly the enzyme;

(e) cooling the mixture from step (d) to an effective temperature to promote hybridization of each primer to each of the single-stranded molecules produced in step (d); and

(f) maintaining the mixture from step (e) at an effective temperature for an effective time to promote the activity of the enzyme and to synthesize, for each different sequence being amplified, an extension product of each primer which is complementary to each strand produced in step (d), but not so high as to separate each extension product from its complementary strand, wherein steps (e) and (f) are conducted simultaneously or sequentially.

4,965,189

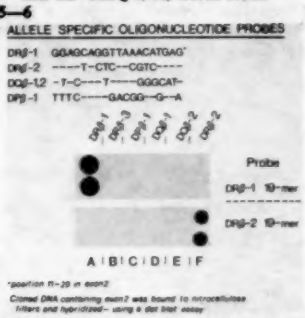
PROBES FOR THE DETERMINATION OF THE PROCLIVITY FOR DEVELOPMENT OF AUTOIMMUNE DISEASES

David Owerbach, Worcester, Mass., assignor to University of Massachusetts Medical School, Worcester, Mass.

Filed Jul. 1, 1986, Ser. No. 880,857

Int. Cl.[5] C12Q *1/68*; C07H *15/12*

U.S. Cl. 435—6 **9 Claims**



4. A method of assaying for a polymorphic region associated with Type I diabetes mellitus in humans, the method comprising

(a) isolating a sample containing genomic or chromosomal DNA from a human

(b) transferring the isolated DNA from step (a) to a substance that binds DNA,

(c) contacting the resultant DNA bound to the substance from step (b) under hybridization conditions with a labelled DQ beta gene oligonucleotide, said oligonucleotide selected from the group consisting of

GCTGGGGCCGCCTGCCGCC,

GAGAAGAGATCGTGCGCTT and

GCTGGGGCTGCCTGCCGCC and

(d) conducting detection for the label.

4,965,190

METHODS FOR THE IDENTIFICATION OF MUTATIONS IN THE HUMAN PHENYLALANINE HYDROXYLASE GENE USING DNA PROBES

Savio L. C. Woo, and Anthony G. DiIella, both of Houston, Tex., assignors to Howard Hughes Medical Institute, Coconut Grove, Fla.

Filed Jul. 31, 1986, Ser. No. 892,227

Int. Cl.[5] C12Q *1/68*; C07H *19/073, 19/173*

U.S. Cl. 435—6 **11 Claims**

7. A method of detecting a mutation in a phenylalanine hydroxylase gene of human genomic DNA comprising:

(a) isolating a phenylalanine hydroxylase clone from a genomic DNA library with a human phenylalanine hydroxylase cDNA probe;

(b) subcloning the phenylalanine hydroxylase gene;

(c) sequencing the gene to define the mutation;

(d) synthesizing an oligonucleotide sequence selected from a group consisting of an oligonucleotide complimentary to the mutated sequence and an oligonucleotide of the sense-strand of the mutated sequence;

(e) synthesizing an oligonucleotide sequence selected from a group consisting of an oligonucleotide complimentary to the normal sequence and an oligonucleotide of the sense-strand of the normal sequence corresponding to the mutated sequence;

(f) hybridizing the synthesized oligonucleotide of (d) and (e) to target DNA; and

(g) identifying the hybridization fragments of step (f).

11. An automated method of detecting PKU affected, PKU helerozgotes and normals in fetal to adult human samples

(a) amplification in vitro of phenylalanine hydroxylase mutations;

(b) detection of the amplified mutations by hybridization with specific oligonucleotide probes for normal and mutant phenylalanine hydroxylase; and

(c) determining the binding of the specific nucleotide probes wherein PKU affected hybridize to the mutant probe, the PKU heterozygotes hybridize to both the mutant and the normal probes and normals hybridize only to the normal probe, and compound heterozygotes hybridize to two mutant sequences and the normal sequences.

4,965,191

LOWER ALCOHOL SULFATE WASH SOLUTION, TEST KIT AND METHOD FOR THE DETERMINATION OF AN IMMUNOLOGICAL LIGAND

Harold C. Warren, III, Rush; Norbert S. Norkus, Webster, and Margaret J. Smith-Lewis, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 12, 1988, Ser. No. 155,441

Int. Cl.[5] G01N *33/53, 33/543, 31/00, 33/48*

U.S. Cl. 435—7 14 Claims

1. A test kit useful for the determination of human chorionic gonadotropin (hCG) comprising:

(a) one or more antibodies for hCG, at least one of which is labeled for detection, and

(b) an aqueous wash solution buffered to a pH of from about 5 to about 9 and comprising at least about 1.5 weight percent of a compound comprising a lower alcohol sulfate anion having from 6 to 10 carbon atoms and an alkali metal or ammonium cation.

4,965,192

A60-ANTIGEN FROM MYCOBACTERIA AND USE THEREOF AS TUBERCULIN AND AS VACCINE

Roland F. Maes, Mutzig, France, assignor to Anda Biologicals, Mutzig, France

Continuation-in-part of Ser. No. 678,470, Dec. 5, 1984, Pat. No. 4,777,130. This application Apr. 29, 1988, Ser. No. 187,919

The portion of the term of this patent subsequent to Oct. 11, 2005, has been disclaimed.

Int. Cl.[5] G01N *33/53, 35/566;* C12Q *1/00;* A61K *39/40*

U.S. Cl. 435—7 4 Claims

1. An interspecific antigen of Mycobacteria consisting essentially of a mixture in substantially immunochemically pure form of a protein having a molecular weight of at least 4×10^6 Daltons and polysaccharide having a molecular weight of at least about 1×10^6 Daltons, and having when subjected to cross-electrophoresis an immunoelectrophoretic precipitation pattern corresponding to A60 antigen of *Mycobacteria bovis* strain BCG.

4,965,193

DETECTION OF MICROBIAL BETA-LACTAMASE

Kirk C. S. Chen, Seattle, Wash., assignor to Washington Research Foundation, Seattle, Wash.

Continuation-in-part of Ser. No. 638,012, Aug. 8, 1984, Pat. No. 4,740,459. This application Oct. 29, 1987, Ser. No. 114,696

Int. Cl.[5] C12Q *1/34*

U.S. Cl. 435—18 7 Claims

1. A method of detecting the presence of beta-lactamase from microbial sources using a beta-lactam ring containing substrate whose amide bond is hydrolyzed in the presence of beta-lactamase, comprising:

(a) contacting a substantially nonfluorescent substrate which includes a beta-lactam ring with an acyl side chain containing an alpha-amino group an alpha-phenyl group or its derivatives, with an organism thought to produce beta-lactamase or with a cell-free preparation thought to contain beta-lactamase, to produce a reaction mixture;

(b) contacting said reaction mixture with a fluorescence developer solution comprising an oxidizing agent in buffer; and

(c) determining whether the reaction product from said substrate, said oxidizing agent, and said organism or said preparation fluoresces as a result of beta-lactamase hydrolysis of said substrate.

2. The method of claim 1 wherein the solution containing the oxidizing agent is selected from the group consisting of Ag+, Hg++, H_2O_2, I_3-, IO_4, persulfate, Pd++, and p-hydroxymercuribenzoate.

4,965,194

PYRUVATE OXIDASE AND AN ANALYTICAL METHOD USING THE SAME

Kazumi Yamamoto; Toshiro Kikuchi, and Shigenori Emi, all of Tsuruga, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Aug. 19, 1987, Ser. No. 87,086

Claims priority, application Japan, Aug. 21, 1986, 61-196230; Sep. 10, 1986, 61-213666

Int. Cl.[5] C12Q *1/26*

U.S. Cl. 435—25 12 Claims

1. A pyruvate oxidase with excellent thermal stability, which has the following characteristics:

(1) it retains substantially 100% activity at pH 7.0 for 10 minutes at a temperature of up to 45° C.; and

(2) its optimum pH is pH 5.7.

4,965,195

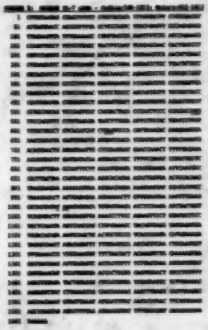
INTERLEUKIN-7

Anthony E. Namen; Raymond G. Goodwin; Stephen D. Lupton, and Diane Y. Mochizuki, all of Seattle,, Wash., assignors to Immunex Corp., Seattle, Wash.

Continuation-in-part of Ser. No. 113,566, Oct. 26, 1987. This application Oct. 7, 1988, Ser. No. 255,209

Int. Cl.[5] C12N *1/00;* C07K *13/00;* C07H *15/12*

U.S. Cl. 435—69.52 17 Claims



1. An isolated and purified double-stranded DNA molecule encoding a polypeptide displaying interleukin 7 biological activity, wherein (A) one DNA strand of said molecule hybridizes to a labeled oligonucleotide probe, under hybridization conditions of 50° C. and 0.9 M NaCl, followed by washing in 1×SSC at 55° C.

4,965,196
POLYCISTRONIC EXPRESSION VECTOR CONSTRUCTION

Arthur D. Levinson, Burlingame, and Christian Simonsen, San Jose, both of Calif., assignors to Genentech, Inc., San Francisco, Calif.

Continuation of Ser. No. 459,152, Jan. 19, 1983, Pat. No. 4,713,339. This application Sep. 24, 1987, Ser. No. 101,223
The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.
Int. Cl.[5] C12P *21/00*; C12N *15/00, 9/06, 5/00*
U.S. Cl. 435—691 **16 Claims**

1. A method for producing a desired mature protein in a vertebrate host cell, which method comprises:

(a) providing an expression vector which vector comprises

(i) a DNA sequence which codes for the desired protein and

(ii) a DNA sequence which codes for a secondary protein wherein each of the sequences (i) and (ii) is operably linked to the same promoter, and separated by a translational stop signal, and a translational start signal;

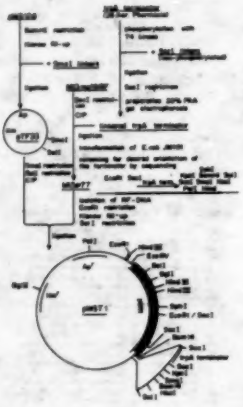
(b) transfecting a vertebrate host cell culture with the vector described in (a); and

(c) allowing the host cell culture to grow under conditions favorable to the production of the secondary protein.

4,965,197
CORYNEFORM EXPRESSION AND SECRETION SYSTEM

Wolfgang Liebl, Eching, Fed. Rep. of Germany, and Anthony J. Sinskey, Boston, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 61,883, Jun. 12, 1987, abandoned. This application Dec. 5, 1989, Ser. No. 446,306
Int. Cl.[5] C12P *21/00*; C12N *15/00, 1/20*
U.S. Cl. 435—69.8 **25 Claims**



1. A Gram positive bacterial expression and secretion system comprising:

an isolated host Corynebacterium which does not produce extracellular proteases; and

a secretion vector containing a first DNA sequence which promotes and regulates the expression in said Corynebacterium host a second DNA sequence that encodes a peptide or polypeptide and wherein said peptide or polypeptide does not naturally occur in said Corynebacterium host and a third DNA sequence inserted between said first and said second DNA sequences and wherein said third DNA sequence encodes for the secretion of said peptide or polypeptide from said Corynebacterium host.

4,965,198
MONOCLONAL ANTIBODY AND METHOD OF MANUFACTURING HYBRIDOMA PRODUCING THE SAME

Masahiko Yamasaki, and Yoshitaka Nagai, both of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 942,977, Dec. 22, 1986, abandoned. This application Apr. 26, 1988, Ser. No. 186,353
Claims priority, application Japan, Dec. 24, 1985, 60-289245; Apr. 27, 1987, 62-103850; Apr. 28, 1987, 62-103012; Jul. 1, 1987, 62-165890
Int. Cl.[5] C12N *5/00*; C12P *21/00*
U.S. Cl. 435—70.21 **39 Claims**

1. A monoclonal antibody capable of specifically binding to a sugar chain containing NeuGcα2-3 Gal- and not capable of binding to a sugar chain containing NeuAc.

4,965,199
PREPARATION OF FUNCTIONAL HUMAN FACTOR VIII IN MAMMALIAN CELLS USING METHOTREXATE BASED SELECTION

Daniel J. Capon, San Mateo; Richard M. Lawn, San Francisco; Arthur D. Levinson, Hillsborough; Gordon A. Vehar, San Carlos, and William I. Wood, San Mateo, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 602,312, Apr. 20, 1984. This application Aug. 7, 1987, Ser. No. 83,758
Int. Cl.[5] C12P *21/00*; C12N *7/00, 15/00*
U.S. Cl. 435—69.6 **13 Claims**

1. A process for producing factor VIII which comprises:

(a) cotransfecting a mammalian host cell with a DNA sequence encoding factor VIII, a second DNA sequence encoding an amplifiable marker, and a third DNA sequence encoding a selectable marker;

(b) growing the transfected cell in a non-selective medium;

(c) transferring the transfected cells to a selection medium and selecting for such selectable marker resistant cells; and

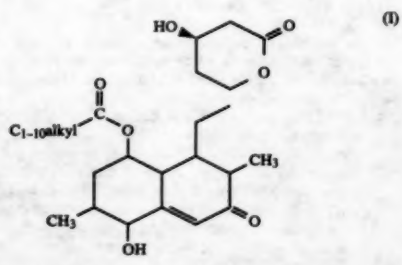
(d) amplifying said amplifiable marker DNA sequence by culturing the selected cells of step (c) in media containing increasing amounts of selection agent, wherein the host cell is not deficient in the amplifiable marker.

4,965,200
PROCESS FOR THE PREPARATION OF 3-KETO, 5-HYDROXY SIMVASTATIN ANALOGS

Shieh-Shung J. Chen, Morganville, and Byron H. Arison, Watchung, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 23, 1989, Ser. No. 370,488
Int. Cl.[5] C12P *17/06*; C12R *1/645*
U.S. Cl. 435—125 **4 Claims**

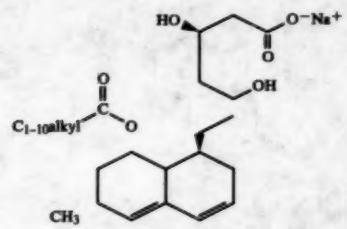
1. A process for the preparation of a compound represented by the formulae (I)



(I)

which comprises culturing a microorganism Streptomyces sp. (MA6578) (ATCC 53898) in a nutrient medium containing

assimilable sources of nitrogen and carbon and the sodium salt (II):



(II)

under aerobic conditions until a substantial amount of the compound is produced and isolating the compound so produced.

4,965,201

PREPARATION OF DICARBOXYLIC ACID

John Casey, Stanwick; Roy T. Dobb, Odell, and Roger Jeffcoat, Stanwick, all of Great Britain

Filed May 11, 1989, Ser. No. 350,378

Claims priority, application European Pat. Off., May 11, 1988, 88200957.4

Int. Cl.[5] C12P *7/64, 7/42;* C12R *1/72*

U.S. Cl. 435—134 9 Claims

1. A process for preparing medium chain dicarboxylic acids by biochemical oxidation characterized in that C_8 to C_{12} dicarboxylic acids are prepared from non-toxic levels of C_8–C_{18} fatty acids or esters thereof using a nitrogen-restricted yeast propagated in a carbon substrate containing growth medium wherein the amount of nitrogen present is between 4 and 9% (w/w).

4,965,202

BIODEGRADATION OF 1,4-DIBENZ-OXAZEPINE AND RELATED COMPOUNDS

Mark V. Haley, Jarretsville, Md., and Wayne G. Landis, Bellingham, Wash., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 27, 1989, Ser. No. 429,299

Int. Cl.[5] C12P *1/04, 13/00;* C12R *1/05*

U.S. Cl. 435—170 17 Claims

1. A process comprising the step of degrading 1,4-dibenzoxazepine with a strain of a biologically pure culture of *Alcaligenes denitrificans denitrificans* which is ATCC 53957.

4,965,203

PURIFIED THROMBIN PREPARATIONS

Steven B. Silbering, Forest Hills, N.Y.; Rowland P. Blythe, Jr., Washington, Mich.; Russell U. Nesbitt, Jr., Somerville, and Mahdi B. Fawzi, Flanders, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 7,555, Jan. 28, 1987, abandoned. This application Jun. 13, 1989, Ser. No. 365,470

Int. Cl.[5] C12N *9/96, 9/74;* A61F *13/00;* A61K *37/547*

U.S. Cl. 435—188 4 Claims

1. In a method of preparing a stable thrombin composition consisting essentially of thrombin, 25–50% of a polyol and a buffer of acetate or phosphate ions, the improvement consisting of further purification of the thrombin comprising:

(a) adsorbing the thrombin on a DEAE agarose column,

(b) eluting the thrombin from the said DEAE agarose column with 0.45 M buffer in 0.45 M NaCl,

(c) adsorbing the eluate of step (b) on a CM agarose column and,

(d) eluting the thrombin from the said CM agarose column with 0.45 M buffer in 0.45 M NaCl.

4,965,204

HUMAN STEM CELLS AND MONOCLONAL ANTIBODIES

Curt I. Civin, Baltimore, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Division of Ser. No. 670,740, Feb. 6, 1984, Pat. No. 4,714,680. This application Jun. 1, 1987, Ser. No. 55,942

Int. Cl.[5] C12N *5/00;* C07K *15/00;* A61K *39/00*

U.S. Cl. 435—240.27 6 Claims

1. A monoclonal antibody which specifically binds to an antigen on non-malignant, immature human marrow cells, wherein said antigen is stage specific and not lineage dependent, and said antigen is also specifically bound by the antibody produced by the hybridoma deposited under ATCC Accession No. HB-8483;

(a) which antigen is present on non-malignant, human blood or bone marrow:

(i) colony-forming cells for granulocytes and monocytes (CFC-GM),

(ii) colony-forming cells for erythrocytes (BFU-E),

(iii) colony-forming cells for eosinophils (CFC-Eo),

(iv) multipotent colony-forming cells (CFC-GEMM), and

(v) immature lymphoid precursor cells;

(b) which antigen is present on a maximum of about 5% non-malignant, human marrow cells and a maximum of about 1% non-malignant, human peripheral blood cells; and

(c) which antigen is not present on non-malignant, mature human myeloid and lymphoid cells.

4,965,205

CULTURE MEDIUM FOR BACTERIA OF THE BORDETELLA GENUS CONTAINING ETHERIFIED DERIVATIVE OF D-GLUCOSE AND A CYCLODEXTRIN

Marie-José B. Quentin-Millet, Villeurbanne; Francois Arminjon, and Roupen R. Donikian, both of Lyons, all of France, assignors to Institut Merieux, Lyons, France

Continuation-in-part of Ser. No. 31,054, Mar. 27, 1987, abandoned. This application Jun. 12, 1989, Ser. No. 364,367

Int. Cl.[5] C12N *1/12, 1/22, 1/20*

U.S. Cl. 435—252 11 Claims

1. A culture medium composition for bacteria of the Bordetella genus comprising a nutrient medium containing cyclodextrin or a derivative thereof and at least one etherified derivative of D-glucose polymer having a molecular mass of at least 2,000.

4,965,206

DETERMINATION OF BIOMASS

Douglas B. Kell, Cwmdarren, Penbont-Rhydybeddau, Cwmsylog, Aberystwyth, Dyfed SY 23 3HB, Wales

Continuation of Ser. No. 99,595, Sep. 22, 1987, abandoned. This application Feb. 9, 1990, Ser. No. 479,211

Claims priority, application United Kingdom, Sep. 22, 1986, 8622747

Int. Cl.[5] C12M *1/34*

U.S. Cl. 435—291 6 Claims

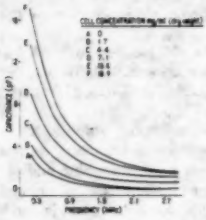
2. A fermentation process utilizing a culture comprising a suspending fluid and cells, said process comprising the steps of:

(a) generating a signal dependent on the dielectric permittivity of the culture in the bulk of the culture using electrical capacitance measurement, at a suitable frequency, between electrodes mutually spaced in said culture or a sample thereof;

(b) providing an indication if the permittivity dependent signal differs from a predetermined value or falls outside a predetermined range, and/or

(c) altering the value of a process parameter to return said signal towards the predetermined value or range, said predetermined frequency being such that the dielectric

permittivity of the material in the bulk of the culture between the electrodes depends on the volume fraction of



the culture enclosed by the cytoplasmic membranes of the cells.

4,965,207

COLOR MARKER FOR CLONINGS IN *STREPTOMYCES LIVIDANS*

Günter Muth; Wolfgang Wohlleben; Alfred Pühler, all of Bielefeld; Gerhard Wöhner, Flörsheim am Main, and Rüdiger Marquardt, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 11, 1987, Ser. No. 83,805

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1986, 3627392

Int. Cl.[5] **C12N** *15/00, 1/20, 1/00;* **C12P** *21/00;* **C07H** *21/04*

U.S. Cl. 435—320 **6 Claims**

1. DNA fragments which effect the expression of a red coloring agent in *Streptomyces lividans*, which DNA fragments are obtainable from the total DNA of *Streptomyces coelicolor* DSM 3030 by cutting said total DNA with BamHI, cloning of the DNA fragments into a vector, transforming *S. lividans*, and selecting for production of a red coloring agent.

4,965,208

INSPECTION OF MULTIPATTERN CIRCUIT BOARDS

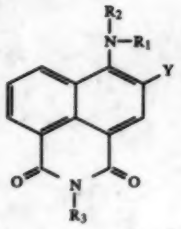
Frank H. Blitchington, Richmond, Va.; Edwin A. Chandross, Berkeley Heights, and Lloyd Shepherd, Madison, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 834,556, Feb. 28, 1986, abandoned, which is a continuation of Ser. No. 518,455, Jul. 29, 1983, abandoned. This application Jan. 19, 1988, Ser. No. 144,763

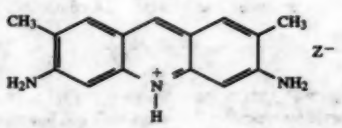
Int. Cl.[5] **G01N** *21/64;* **B32B** *15/08, 27/38*

U.S. Cl. 436—5 **14 Claims**

1. A patterned substrate comprising a first metal pattern overlying a substrate and a second metal pattern on the side of said substrate opposing said overlying metal pattern wherein the thickness of said substrate is less than about 1.25 mm and said substrate includes a light scattering medium, and said substrate further includes a dye capable of fluorescing upon interacting with light, wherein said dye is distributed in regions of said substrate underlying or overlying said first metal pattern and said second metal pattern, and wherein said dye has a chemical structure represented by a member chosen from the group consisting of (I)

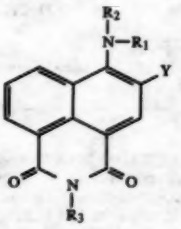


and (2)

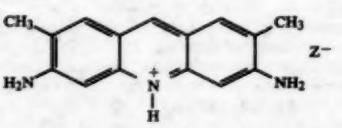


where Y is SO_3G, (G is an alkali metal cation), or H, R_1 and R_2 are individually hydrogen, methyl, or ethyl, and R_3 is a lower alkyl, p-tolyl, xylyl, or hydrogen, and Z^- is Cl^-, Br^-, I^-, NO_3^-, or p-toluenesulfonate.

8. A process for detecting flaws in a first metal pattern which is formed on a substrate that has a second metal pattern on the side of said substrate opposing said metal pattern comprising the steps of illuminating said substrate with a source of electromagnetic radiation, detecting the resulting fluorescence from said substrate, and further processing said substrate on the basis of said detection wherein the thickness of said substrate is less than about 1.25 mm and said substrate includes a electromagnetic radiation scattering medium, and said substrate includes a dye capable of fluorescing, wherein said dye is distributed in regions of said substrate underlying or overlying said first metal pattern and said second metal pattern, and wherein said dye comprises a material having a chemical structure represented by a member chosen from the group consisting of (I)



and (2)



where Y is SO_3G or hydrogen, G is an alkali metal cation, R_1 and R_2 are individually hydrogen, methyl, or ethyl, and R_3 is a lower alkyl, p-tolyl, xylyl, or hydrogen, and Z^- is Cl^-, Cr^-, I^-, NO_3^- or p-toluenesulfonate.

4,965,209

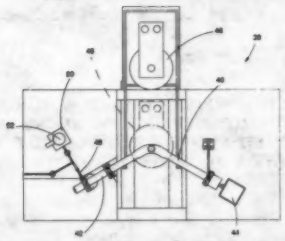
ISOTOPE ANALYSIS OF CLOSELY ADJACENT MINERALS

Michael P. Smith, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 88,760, Aug. 24, 1987, abandoned. This application Apr. 12, 1989, Ser. No. 338,345

Int. Cl.[5] G01N *33/24*

U.S. Cl. 436—32 18 Claims



1. A method of determining an indicator of at least one of hydrocarbon formation, migration, and accumulation during mineral development, comprising the steps of:

searching for a class of minerals in a mineral specimen comprising more than one class of minerals;

identifying in the mineral specimen a target sample of the thus searched for class;

directing thermally pyrolyzing laser beam radiation onto surface mineral substance of the target sample in the mineral specimen releasing surface mineral substance pyrolysate gases therefrom; and

determining isotope composition essentially of the surface mineral substance from analyzing the pyrolysate gases released from the thus pyrolyzed target sample, the isotope composition including isotope(s) selected from the group consisting of carbon, hydrogen, and oxygen isotopes;

determining an indicator of at least one of hydrocarbon formation, migration, and accumulation during mineral development of the target mineral from thus determined isotope composition of surface mineral substance pyrolysate.

4,965,210

STABLE REAGENT FOR DETERMINING BILIRUBIN IN SERUM AND METHOD OF PREPARATION

Ivan E. Modrovich, 96 Natalie Way, Camarillo, Calif. 93010

Continuation-in-part of Ser. No. 101,776, Sep. 29, 1987, abandoned. This application May 25, 1989, Ser. No. 357,023

Int. Cl.[5] G01N *21/78, 33/72*

U.S. Cl. 436—97 21 Claims

1. A liquid assay composition for determining total bilirubin in biological fluids which comprises an aqueous solution of water, a complexing agent present in a concentration sufficient to complex heavy metals, from about 0.05 to about 15 mM of at least one diazonium salt, from about 1 g/l to solution saturation of a water soluble organic sulfate, and from 0 to about 100 g/l caffeine, and wherein said composition has a pH from about 1.0 to about 6.0 and is stable at least 18 months at 2° C. to 8° C.

14. A method for forming a stable liquid assay composition suitable for determining total bilirubin in biological fluids at 540 nanometers which comprises forming a solution by dissolving at least one complexing agent in water in an amount sufficient to complex heavy metal ions, followed by dissolving in the solution of water and complexing agent at least one water soluble organic sulfate to a concentration of from about 1 g/l to solution saturation, caffeine to a concentration of from about 0 to about 100 g/l, and then adding to the resultant solution at least one diazonium salt to a concentration of from about 0.05 to about 15 mM of solution, to form a composition which has a pH of about 1.0 to about 6.0 and is stable at least 18 months at 2° C. to 8° C.

4,965,211

FLUOROMETRIC ANALYSIS METHOD

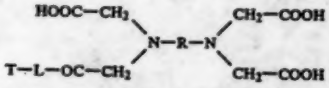
Irwin Wieder, 459 Panchita Way, Los Altos, Calif. 94022, and Robert H. Wollenberg, Los Altos, Calif., assignors to Irwin Wieder, Los Altos, Calif.

Continuation of Ser. No. 260,575, May 5, 1981, abandoned, which is a division of Ser. No. 73,728, Sep. 10, 1979, Pat. No. 4,352,751. This application Nov. 9, 1983, Ser. No. 550,504

Int. Cl.[5] C07C *101/26*; G01N *33/52*; C12Q *1/06*

U.S. Cl. 436—543 43 Claims

1. In a process for fluorometrically determining the presence of a biologically active organic species by covalently affixing a fluorescent tag to individual molecules of the species, thereby forming a fluorescent tagged species, exciting the fluorescent tagged species with a pulse of radiation, and detecting the fluorescence of the fluorescent tagged species after the fluorescence of ambient substances has substantially decayed; the improvement comprising employing a fluorescent tagged species comprising a reagent having the structural formula:



wherein R is a two to eight atom covalent bridge selected from carbon-oxygen ether bridges, carbon-nitrogen secondary and teritary amide bridges and carbon-carbon alkylene, cycloalkylene and arylene bridges, T is the biologically active organic species to be fluorometrically quantified, T being other than aliphatic mono- or polyamine, or aliphatic mono- or polyol, but comprising at least one originally present or added primary amine, secondary amine, thiol or hydroxyl functional group, and L is said at least one functional group in deprotonated form covalently bonding T to the indicated carbonyl carbon of the diamine triacetic acid.

4,965,212

OPTICAL SENSOR

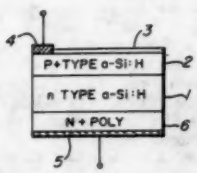
Metin Aktik, Bromont, Canada, assignor to Mitel Corporation, Ontario, Canada

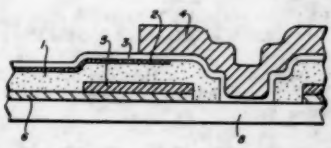
Division of Ser. No. 284,818, Dec. 14, 1988, Pat. No. 4,866,499, which is a continuation of Ser. No. 908,666, Sep. 17, 1986, abandoned. This application Jul. 31, 1989, Ser. No. 386,623

Claims priority, application Canada, Mar. 24, 1986, 504872

Int. Cl.[5] H01L *31/18*

U.S. Cl. 437—4 9 Claims





1. A method of fabricating a photosensitive diode element, comprising the steps of:

(a) depositing and etching a first conductive layer over an insulating substrate,

(b) depositing over said first conductive layer and said substrate, and etching, a layer of n-type hydrogenated amorphous silicon to form a cathode portion of said diode element,

(c) implanting p+ material into predetermined portions of said n-type layer, the predetermined portions being sufficiently thin to allow optical energy to pass therethrough, to form an anode portion of said diode element,

(d) depositing a further conductive layer, and etching said further conductive layer for connection to said p+ implanted portions along an edge of and over said p+ implanted portions, and

(e) forming connections from said first and further conductive layers to external cathode and anode contacts, respectively.

4,965,213

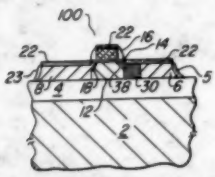
SILICON-ON-INSULATOR TRANSISTOR WITH BODY NODE TO SOURCE NODE CONNECTION

Terence G. W. Blake, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 150,799, Feb. 1, 1988, abandoned. This application Jul. 8, 1988, Ser. No. 216,932

Int. Cl.[5] H01L *21/266, 21/336*

U.S. Cl. 437—21 6 Claims



1. A method of fabricating an integrated circuit in a semiconductor layer overlying an insulating film, comprising:

defining first and second portions of said semiconductor layer, said first and second portions of first and second conductivity types, respectively;

forming a gate electrode over each of said first and second portions;

applying a first mask layer over said first and second portions to expose a contact region adjacent a source side of the gate electrode over said first portion and to expose source and drain regions adjacent said gate electrode over said second portion, and to cover a contact region adjacent a source side of the gate electrode over said second portion and to cover source and drain regions adjacent the gate electrode over said first portion;

doping the exposed locations of said first and second portions with a dopant of said first conductivity type;

applying a second mask layer over said first and second portions to expose the contact region of said second portion and the source and drain regions of said first portion, and to cover said contact region of said first portion and the source and drain regions of said second portion;

doping the exposed portions of said first and second portions with a dopant of said second conductivity type; and

forming a silicide film over the source and contact regions of said first and second portions.

4,965,214

METHOD FOR MANUFACTURING POLY-CRYSTAL SILLICON HAVING HIGH RESISTANCE

Kyu H. Choi; Jung H. Lee, both of Seoul; Heyung-Sub Lee, Daejun; Tae-Yoon Yook, and Dong-Joo Bae, both of Suwon, all of Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 27, 1988, Ser. No. 224,810

Claims priority, application Rep. of Korea, Jul. 31, 1987, 1987-8419

Int. Cl.[5] H01L *21/265, 21/70*

U.S. Cl. 437—24 21 Claims

1. In a method for manufacturing polycrystalline silicon device having high resistance, the improvement comprising:

a first step for depositing a polycrystalline silicon layer for a resistor area over a silicon semiconductor substrate;

a second step for growing a first thermal oxide layer having a first specified depth over the polycrystalline silicon layer, implanting nitrogen ions over the surface of the first thermal oxide layer, and growing a second thermal oxide layer having a second specified depth on the ion-implanted first thermal oxide layer; and

a third step of decreasing resistance of the polycrystalline silicon layer by ion implanting impurities in selected contact regions of said polycrystalline layer to be used as low resistance contacts between intermediate regions of the polycrystalline silicon layer and other regions of the device on the substrate.

4,965,215

MANUFACTURING PROCESS FOR A MONOLITHIC SEMICONDUCTOR DEVICE COMPRISING AT LEAST ONE TRANSISTOR OF AN INTEGRATED CONTROL CIRCUIT AND ONE POWER TRANSISTOR INTEGRATED ON THE SAME CHIP

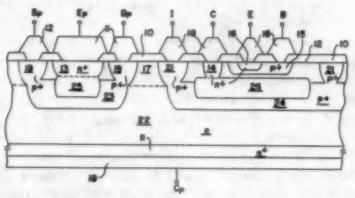
Raffaele Zambrano, Mercato San Severino, and Salvatore Musumeci, Riposto, both of Italy, assignors to SGS-Thomson Microelectronics S.r.L., Brianza, Italy

Filed Dec. 21, 1988, Ser. No. 287,067

Claims priority, application Italy, Dec. 22, 1987, 6630 A/87

Int. Cl.[5] H01L *21/331*

U.S. Cl. 437—31 2 Claims



1. A manufacturing process for a monolithic semiconductor device comprising at least one transistor of an integrated control circuit and one power transistor integrated on the same chip, the phases of which envisage:

the epitaxial growth on a semiconductor substrate (11) of a first type of conductivity, of a semiconductor layer (22) which is also of the aforesaid first type of conductivity;

the simultaneous formation, by diffusion of doping agent within the surface of the layer (22), of a first semiconductor region (23) and a second semiconductor region (24) of a second type of conductivity, said first region (23) constituting the base region of the power transistor, said second region (24) constituting the horizontal insulating region of the integrated control circuit with respect to the power transistor;

the simultaneous formation, by diffusion within the surface of the aforesaid regions (23) and (24), of two regions (25) and (26), respectively, of the first type of conductivity, constituting, respectively, the emitter region of the power transistor and the buried layer of the collector region of the integrated control circuit transistor;

the formation, by further subsequent superficial diffusions, of the base (15) and the emitter (16) of the aforesaid transistor of the integrated control circuit;

the formation, by simultaneous diffusion, of connecting regions (21) and (19), at the surface (12) of the horizontal insulating region (24) and base region (23) of the power transistor, respectively;

the formation, by simultaneous diffusion, of enrichment regions (13) and (14) for the emitter (25) of the power transistor and the buried layer (26) of the integrated control circuit transistor, respectively; characterized by the fact that the formation of the regions (21), (19), (13) and (14) of the base (15) and of the emitter (16) of the transistor

of the integrated control circuit is preceded by the epitaxial growth of a semiconductor layer (17) of the first type of conductivity.

4,965,216

METHOD OF FABRICATING A BI-CMOS DEVICE

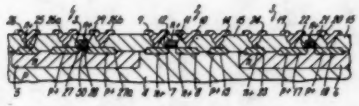
Peter D. Scovell, Chelmsford; Peter F. Blomley, Bishop's Stortford, and Roger L. Baker, Chelmsford, all of Great Britain, assignors to STC PLC, London, England

Continuation of Ser. No. 412,539, Sep. 22, 1989, abandoned, which is a continuation of Ser. No. 249,203, Sep. 23, 1988, abandoned, which is a continuation of Ser. No. 27,870, Mar. 19, 1987, abandoned. This application Jan. 26, 1990, Ser. No. 471,031

Claims priority, application United Kingdom, Mar. 26, 1986, 8607594

Int. Cl.[5] H01L *21/331, 21/335*

U.S. Cl. 437—31 **2 Claims**



1. A method of fabricating simultaneously a polysilicon emitter bipolar transistor and a complementary pair of an n-channel and a p-channel field effect transistors in a common silicon semiconductor substrate, said bipolar transistor and n-channel field effect transistor being disposed in respective n-type wells in said substrate and said p-channel transistor being disposed in a substrate region located immediately between said n-type wells, the method consisting of the steps of;

(a) providing a uniform single crystal silicon substrate of p-type material;

(b) forming first and second spaced wells on n-type material in a major surface of the substrate by means of a first mask;

(c) providing a silicon nitride film on said surface and patterning said film by means of a second mask to define device areas in register with said n-type wells for the bipolar and n-channel field effect transistor and over an undoped substrate region between said wells for the p-channel field effect transistor;

(d) oxidising the substrate surface to form field oxide in those areas not protected by the nitride film;

(e) removing the nitride film from said protected areas and providing a thin oxide film in those areas;

(f) ion implanting a p-type layer beneath a said thin oxide film into said first n-type well by means of a third mask whereby to provide a base region for the bipolar transistor;

(g) providing by means of a fourth mask a window in that thin oxide film below which the p-type layer is implanted;

(h) depositing a layer of polycrystalline silicon (polysilicon) on said oxidised major surface and patterning said polysilicon layer by means of a fifth mask to define simultaneously a polysilicon emitter body in register with the window over t[illegible]-type layer in said first well, a first gate electrode ove[illegible]e second n-type well, and a second gate electrode over t[illegible]e substrate region between the well, said gate electrode being disposed each on or over the thin oxide;

(i) ion implanting a p-type dopant to provide p^+-type base contact regions contiguous with the p-type layer in said first well to form the base structure of the bipolar transistor, p^+-type drain and source regions for the n-channel transistor in said second n-type well and a p^+-type substrate contact region between the wells, the polysilicon emitter body and the first polysilicon gate providing alignment masks for the p-type base contact and source and drain regions respectively, and a sixth mask providing, in combination with the patterned field oxide, for the positioning of the p^+-type substrate contact;

(j) ion implanting by means of a seventh mask an n^+-type dopant to provide an n^+-type collector contact region in said first well and spaced from the base structure, n^+-type drain and source regions for the p-channel transistor in the substrate region between the wells, and an n^+-type well contact in said seventh well;

(k) oxidising the substrate surface, applying a glass layer thereto, and patterning said glass layer by means of an eighth mask to provide contact windows in the glass layer exposing the p^+-type base contact regions and the collector contact region of the bipolar transistor, the drain and source regions of the p-channel and n-channel transistors, and the well contact, the oxidising step providing thermal drive-in of the ion implants;

(l) metallizing the substrate surface and patterning the metallization by means of a ninth mask to contact the exposed regions via said contact windows.

4,965,217

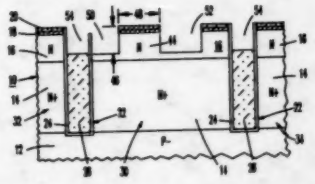
METHOD OF MAKING A LATERAL TRANSISTOR

Brian H. Desilets, Wappingers Falls; Chang-Ming Hsieh, and Louis L. Hsu, both of Fishkill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 13, 1989, Ser. No. 337,802

Int. Cl.[5] H01L *21/331*

U.S. Cl. 437—32 **6 Claims**



1. A method of fabricating a lateral transistor comprising the steps of:

providing a body of semiconductor material including a device region of a first conductivity type;

patterning the surface of said device region to define a first transistor region;

filling the patterned portion of said device region surrounding said first transistor region with an insulating material to a height generally equal to the surface of said first transistor region;

forming a layer of conductive material over the surface of said device region;

anisotropically etching said layer of conductive material and said insulating material so as to define a pair of trenches generally bounding opposite sides of said first transistor region and so as to form exposed edges of said layer of conductive material adjacent each of said trenches;

filling said pair of trenches with doped conductive material of opposite conductivity type to said first transistor region such that said doped conductive material extends into contact with the exposed edges of said layer of conductive material; and

heating said semiconductor body whereby to form second and third transistor regions of opposite conductivity type to said first transistor region in the opposing sides of said first transistor region and whereby to form electrical connections between said doped conductive material and the exposed edges of said layer of conductive material.

4,965,218

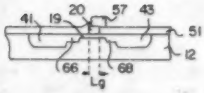
SELF-ALIGNED GATE REALIGNMENT EMPLOYING PLANARIZING OVERETCH

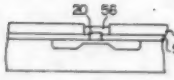
Arthur E. Geissberger; Robert A. Sadler, both of Roanoke; Paulette Luper, Salem, and Matthew L. Balzan, Roanoke, all of Va., assignors to ITT Corporation, New York, N.Y.

Division of Ser. No. 137,309, Dec. 23, 1987, Pat. No. 4,847,212, and a continuation-in-part of Ser. No. 2,084, Jan. 12, 1987, abandoned, said Ser. No. 137,309, is a continuation-in-part of Ser. No. 2,083, Jan. 12, 1987, Pat. No. 4,782,032, Ser. No. 2,084, Ser. No. 4,992, Jan. 20, 1987, and Ser. No. 113,367, Oct. 21, 1987, which is a continuation of Ser. No. 789,523, Oct. 21, 1985, abandoned. This application Aug. 23, 1988, Ser. No. 235,393

Int. Cl.[5] H01L *21/338*

U.S. Cl. 437—41 5 Claims





1. A process for the manufacture of self-aligned gate GaAs FET's having reduced gate length and improved gate resistance comprising:

(a) providing a substrate;

(b) forming a layer of GaAs on said substrate;

(c) forming an active channel region in said layer of GaAs;

(d) forming a first patterned gate layer comprising a gate of a refractory metal;

(e) ion implanting source and drain regions on respective sides of said gate;

(f) providing a first dielectric layer over said first patterned gate layer and said source and drain regions;

(g) providing a sacrificial layer of etchable material over said first dielectric layer;

(h) exposing a top portion of said first patterned gate layer by non-selectively etching said sacrificial layer and said dielectric layer, said top portion having a lateral expanse encompassing said gate;

(i) providing a non-critically aligned photoresist mask over the dielectric layer and patterning said photoresist mask to expose said top portion;

(j) forming a second gate layer of a material having low sheet resistivity overlying said photoresist mask and directly contacting said top portion through said photoresist mask; and

(k) removing said photoresist mask and lifting off said second gate layer overlying said photoresist mask to leave a non-critically aligned second gate layer directly contacting said top portion.

4,965,219

METHOD FOR THE MANUFACTURING OF INSULATED GATE FIELD EFFECT TRANSISTORS (IGFETS) HAVING A HIGH RESPONSE SPEED IN HIGH DENSITY INTEGRATED CIRCUITS

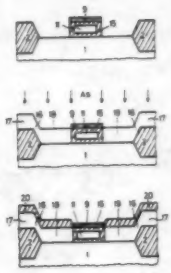
Gianfranco Cerofolini, Milan, Italy, assignor to SGS Microelettronica SpA

Continuation of Ser. No. 136,452, Dec. 21, 1987, abandoned, which is a continuation of Ser. No. 757,070, Jul. 19, 1985, abandoned. This application Jan. 19, 1990, Ser. No. 470,445

Claims priority, application Italy, Jul. 19, 1984, 21968 A/84

Int. Cl.[5] H01L *21/335*

U.S. Cl. 437—40 5 Claims



1. A method for the formation of an insulated gate field effect transistor on a substrate of monocrystalline silicon comprising the steps of:

forming a gate insulation on said substrate;

forming a conductive silicon gate layer on said gate insulation;

forming a screening layer over said conductive silicon gate layer;

selectively etching said screening layer, said conductive silicon gate layer and said gate insulator to form exposed edges on said conductive silicon gate layer and to expose said substrate;

oxidizing said exposed edges of said conductive silicon gate layer; and

following said oxidizing step, positing epitaxial silicon source-drain regions in contact with said substrate using said screening layer to avoid deposition of silicon over said conductive silicon gate layer.

4,965,220

METHOD OF MANUFACTURING A SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE COMPRISING AN MOS TRANSISTOR AND A BIPOLAR TRANSISTOR

Hiroshi Iwasaki, Chigasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 96,241, Sep. 8, 1987, Pat. No. 4,818,720, which is a continuation of Ser. No. 846,512, Mar. 31, 1986, abandoned, which is a division of Ser. No. 658,029, Oct. 5, 1984, abandoned. This application Feb. 6, 1989, Ser. No. 306,393

Claims priority, application Japan, Oct. 7, 1983, 58-187930

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[5] H01L *21/70, 21/265*

U.S. Cl. 437—59 4 Claims

1. A method of manufacturing a semiconductor integrated circuit device which comprises a bipolar transistor and a field effect transistor, the method comprising the steps of:

forming, in a semiconductor substrate of a first conductivity type, first semiconductor regions of a second conductivity type;

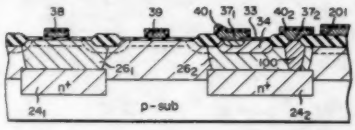
forming a semiconductor layer of said first conductivity type on said semiconductor substrate;

forming, on said semiconductor layer, second semiconductor regions of said second conductivity type contacting said first semiconductor regions;

forming, on said semiconductor layer, an insulation film having a contact hole formed therein leading to a portion of a predetermined one of said second semiconductor regions;

forming an impurity diffusion source layer of said second conductivity type on both said insulation film and said portion of said last-mentioned second semiconductor region via said contact hole;

doping said last-mentioned second semiconductor region with an impurity from said impurity diffusion source layer via said contact hole formed in said insulation film, to



form, in said last-mentioned second semiconductor region, a third semiconductor region of said second conductivity type constituting a collector leading region, having a high impurity concentration and contacting the first semiconductor region contacting said last-mentioned second semiconductor region; and

patterning said impurity diffusion source layer to form a gate electrode of a field effect transistor and a collector electrode of a bipolar transistor with said bipolar transistor being formed in said last-mentioned second semiconductor region and said field effect transistor being formed in said semiconductor layer where said second semiconductor region is not formed or in another predetermined one of said second semiconductor regions.

4,965,221

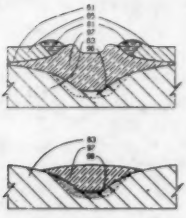
SPACER ISOLATION METHOD FOR MINIMIZING PARASITIC SIDEWALL CAPACITANCE AND CREATING FULLY RECESSED FIELD OXIDE REGIONS

Charles H. Dennison, and Fernando Gonzalez, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Mar. 15, 1989, Ser. No. 322,932

Int. Cl.[5] H01L *21/76*

U.S. Cl. 437—70 **11 Claims**



1. A spacer isolation method for minimizing parasitic sidewall capacitance and creating fully-recessed field oxide isolation regions within an integrated circuit array fabricated on a silicon substrate, comprising the following steps:

(a) growth of a pad oxide layer on the upper surface of the silicon substrate;

(b) deposition of a silicon nitride layer on top of the pad oxide layer;

(c) deposition of a photoresist mask on top of the silicon nitride layer, thus defining masked and unmasked portions of the silicon nitride layer;

(d) etching of the unmasked portions of the nitride layer to expose the pad oxide below;

(e) stripping of the photoresist mask;

(f) deposition of a conformal spacer-material layer over the surface of the array;

(g) anisotropic etching of the spacer-material layer to such an extent that the pad oxide which was exposed prior to the deposition of the spacer-material layer is etched away to expose the silicon substrate below, and a portion of the spacer-material layer remains as spacers about the peripheries of apertures etched within the nitride layer;

(h) etching of exposed silicon substrate within the array to form trenches in the silicon substrate;

(i) implanting of a field-stop impurity in the silicon substrate directly beneath the trenches;

(j) oxidation of the silicon substrate that forms the walls and floor of the trenches to such an extent that silicon oxide has grown to a level that is higher than that of the surrounding silicon nitride-masked silicon substrate; and

(k) etching of the silicon oxide to the point where it is essentially coplanar with the surrounding silicon substrate.

4,965,222

METHOD OF MANUFACTURING AN EPITAXIAL INDIUM PHOSPHIDE LAYER ON A SUBSTRATE SURFACE

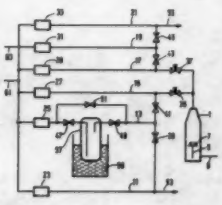
Aemilianus G. J. Staring, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 2, 1989, Ser. No. 416,182

Claims priority, application Netherlands, Oct. 7, 1988, 8802458

Int. Cl.[5] H01L *21/20*

U.S. Cl. 437—81 **4 Claims**



1. A method of providing an epitaxial indium phosphide layer on a substrate surface by bringing a gas mixture comprising a metalorganic indium compound and phosphine into contact with the heated substrate surface, characterized in that cyclopentadienyl indium (I) is used as the metalorganic indium compound, the cyclopentadiene group optionally being alkyl-substituted.

4,965,223

METHOD OF MANUFACTURING A PARTIALLY OPAQUE SUBSTRATE RED LED

Frank M. Steranka, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 122,150, Nov. 18, 1987, Pat. No. 4,864,371. This application Jun. 13, 1989, Ser. No. 365,630

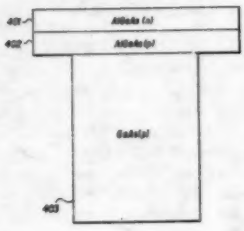
Int. Cl.[5] H01L *21/208, 21/20*

U.S. Cl. 437—127 **2 Claims**

1. A method for producing a light emitting diode, the method comprising the steps of:

(a) Depositing a plurality of epitaxial layers upon a substrate;

(b) Dividing the substrate into sections which will function as light emitting diodes; and,



(c) Selectively etching the substrate in each section to reduce in each section the surface area in which the substrate is attached to the plurality of epitaxial layers.

4,965,224

PROCESS FOR FABRICATING AN INP SEMICONDUCTOR THIN FILM ON SILICON

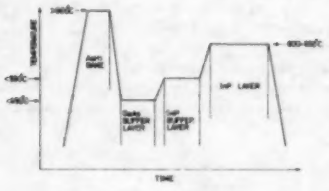
Hideaki Horikawa, and Masahiro Akiyama, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1989, Ser. No. 308,252

Claims priority, application Japan, Feb. 16, 1988, 63-31878

Int. Cl.[5] H01L *21/20*

U.S. Cl. 437—132 **10 Claims**



1. A process for fabricating an InP semiconductor thin film, comprising the steps of:

providing an Si substrate;

performing heat-treatment of the Si substrate;

forming an amorphous GaAs buffer layer having a good surface flatness on the Si substrate;

forming an amorphous InP buffer layer having a good surface flatness on the GaAs buffer layer; and

growing an InP monocrystalline thin film on the InP buffer layer.

4,965,225

METHOD OF STABILIZING AMORPHOUS SEMICONDUCTORS

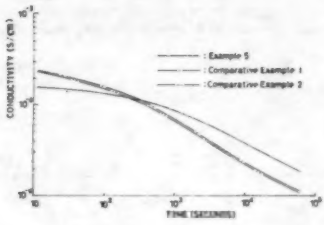
Hideo Yamagishi; William A. Nevin; Hitoshi Nishio; Keiko Miki; Kazunori Tsuge, and Yoshihisa Tawada, all of Hyogo, Japan, assignors to Kanegafuchi Chemical Industry Co., Ltd., Osaka, Japan

Filed Sep. 28, 1989, Ser. No. 413,916

Claims priority, application Japan, Sep. 30, 1988, 63-248451

Int. Cl.[5] H01L *21/477, 21/42*

U.S. Cl. 437—173 **7 Claims**



1. A method of stabilizing an amorphous silicon semiconductor comprising exposing it intermittently to light of high intensity at a temperature not lower than 150° C.

4,965,226

METHOD OF FORMING AN INTERCONNECTION BETWEEN CONDUCTIVE LEVELS

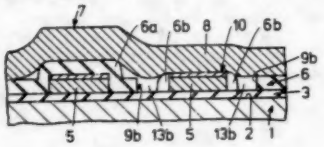
Wilhelmus F. M. Gootzen, and Kazimierz Osinski, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 229,377, Aug. 5, 1988, abandoned. This application Jan. 16, 1990, Ser. No. 465,560

Claims priority, application United Kingdom, Oct. 16, 1987, 8724319

Int. Cl.[5] H01L *21/90*

U.S. Cl. 437—189 **20 Claims**



1. A method of forming an interconnection between conductor levels comprising the steps of

(a) providing a first conductive level on a surface of a substrate body, said first conductive level having at least one contact area;

(b) providing a passivating material over said surface to cover said first conductive level;

(c) anisotropically etching said passivating material to form at least one window over said contact area, said window being larger than said contact area such that gaps are provided between side walls of said first conductive level and peripheries of said window, said anisotropic etching leaving fillets of said passivating material at said side walls, thereby minimizing said gaps;

(d) providing smoothing material over each of said passivating material, said gaps, and said contact area to form smooth surfaces, said smoothing material being thinner over said passivating material and said contact area than over said gaps;

(e) etching said smoothing material from said contact area to expose a top surface of said contact area; and

(f) providing a second conductive level on said passivating material, said second conductive level having portions extending into said window and contacting said first conductive level at said contact area.

4,965,227

PROCESS FOR MANUFACTURING PLASTIC PIN GRID ARRAYS AND THE PRODUCT PRODUCED THEREBY

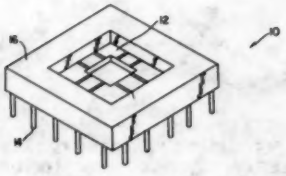
Kin-Shiung Chang, Meriden; Thomas A. Armer, New Haven, both of Conn., and William G. Bridges, San Jose, Calif., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 52,327, May 21, 1987, Pat. No. 4,816,426, which is a continuation-in-part of Ser. No. 16,614, Feb. 19, 1987, abandoned. This application Feb. 2, 1988, Ser. No. 145,977

The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.

Int. Cl.[5] H01L *21/56*

U.S. Cl. 437—207 35 Claims



1. A process for forming an integrated circuit pin grid array package, comprising the steps of:

providing an interconnect tape having first and second opposing surfaces, said first surface having a metal circuit pattern defining a plurality of leads;

forming a plurality of holes of a first diameter in said metal circuit pattern;

providing a plurality of pins, said pins defined by a pin head end of a second diameter, an insertion end and a collar of a third diameter disposed therebetween, said collar defined by first and second shoulder wherein said third diameter is larger than said first diameter and said first diameter is larger than said second diameter;

inserting said insertion end of said pin into a first fixture;

placing said interconnect tape over said pin head end such that said holes in said circuit pattern encircle said pin heads and said interconnect tape rests on said first shoulder of said pins; and

soldering said pins to said interconnect tape using a mask to control said solder.

4,965,228

GELATION OF ALUMINUM SOLUTIONS USING MAGNESIUM OXIDE

Thomas D. Hutchinson, 3513 Rosetta La., Anniston, Ala. 36201

Filed Aug. 9, 1989, Ser. No. 391,356

Int. Cl.[5] B01J *13/00*

U.S. Cl. 501—12 2 Claims

1. The process of making a shaped ceramic aggregate by:

(a) mixing a solution consisting essentially of; aluminum ions derived from soluble aluminum compounds other than aluminum chloride in a minimum concentration of 1.0%; magnesium oxide in a concentration of at least two times that of the aluminum ions; and a ceramic material in any order or conjointly,

(b) ramming, casting, or shaping the aggregate in a rigid mold, and

(c) allowing gelation to take place to form a viable green ceramic shape.

4,965,229

GLASS CERAMIC FOR COATING METAL SUBSTRATE

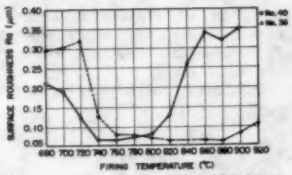
Atsushi Nishino, Neyagawa; Yasuo Mizuno, Hirakata; Masaki Ikeda, Hirakata, and Masahiro Hiraka, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 1, 1989, Ser. No. 304,476

Claims priority, application Japan, Feb. 5, 1988, 63-26131; Feb. 5, 1988, 63-26132

Int. Cl.[5] C03C *8/00*

U.S. Cl. 501—14 3 Claims



1. A glass ceramic for coating metal substrates of which the principal components at least comprise 3–40% of La_2O_3 or CeO_2, 20–50% of MgO, 1–20% of CaO, 0–15% BaO, 10–30% of B_2O_3, 8–20% of SiO_2, 0–5% of MO_2, M being at least one metal selected from Zr, Ti and Sn, and 0–5% of P_2O_5, respectively in terms of % by weight.

4,965,230

ALUMINA POROUS BODY AND PRODUCTION OF THE SAME

Hirohito Nakajima; Takaaki Ito, and Yukito Muraguchi, all of Tokoname, Japan, assignors to Inax Corporation, Tokoname, Japan

Filed Mar. 2, 1989, Ser. No. 317,720

Claims priority, application Japan, Mar. 2, 1988, 63-49425; Dec. 26, 1988, 63-330304

Int. Cl.[5] C04B *35/10*

U.S. Cl. 501—128 13 Claims

1. An alumina porous body which consists essentially of coarse alumina particles as a filler and 3–20 wt % SiO_2 based on the coarse aluminum particles said alumina and SiO_2 forming mullite on the surfaces of the coarse alumina particles through the reaction between the coarse alumina particles and the SiO_2 that takes place at the time of firing, said mullite binding said coarse alumina particles, and wherein there are formed pores between the coarse alumina particles.

4,965,231

ALUMINA-ZIRCONIA-SILICON CARBIDE-MAGNESIA COMPOSITIONS AND ARTICLES MADE THEREFROM

Pankaj K. Mehrotra, and Elizabeth R. Billman, both of Greensburg, Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Nov. 3, 1988, Ser. No. 266,735

The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.

Int. Cl.[5] C04B 35/56

U.S. Cl. 501—89 28 Claims

1. An alumina based ceramic composition consisting essentially of:

about 1.5 to 17.5 v/o silicon carbide whiskers;

about 5 to 17.5 v/o zirconia;

a residue of a magnesia addition added in the amount of about 0.03 to 3 v/o;

alumina forming essentially the remainder of said composition;

wherein said silicon carbide whiskers, said zirconia and said residue of said magnesia addition are substantially homogeneously dispersed in a matrix formed of said alumina; and

wherein at least about 4.0 v/o of said ceramic composition is tetragonal zirconia.

4,965,232

PROCESS FOR FLUIDIZED-BED CATALYST REGENERATION

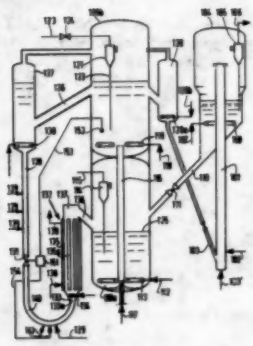
Jean-Louis Maubeon, Marly le Roi; Jean-Bernard Siguad, Vaucresson; Renaud Pontier, Luzinay, and Frederic Hoffmann, Paris, all of France, assignors to Compagnie de Raffinage et de Distribution Total France, Levallois-Perret and Institut Francais du Petrole, Rueil-Malmaison, both of, France

Filed Mar. 9, 1989, Ser. No. 321,515

Claims priority, application France, Mar. 9, 1988, 88 03030; Jul. 8, 1988, 88 09441

Int. Cl.[5] B01J 38/34, 38/36, 38/32; C10G 11/18

U.S. Cl. 502—43 13 Claims



1. A process for the continuous regeneration of catalyst particles by combustion in a fluidized bed of the coke deposited on the catalyst particles in the course of a hydrocarbon-conversion reaction, comprising burning in a first regeneration stage a proportion of about 50 to 90 percent of the coke remaining on stripped catalyst particles received from a hydrocarbon-conversion zone, at a temperature T_1 which does not exceed about 730° C., in a first regeneration zone operated with a dense fluidized bed; the catalyst particles to be regenerated being introduced to said first zone essentially countercurrently to an oxygen-containing fluid; said first regeneration zone having its own discharge outlet for gaseous effluents containing steam entrained or generated during such combustion, and a CO/CO_2 ratio ranging from 0.3 to 1.5; burning the 10 to 50 percent of residual coke from the catalyst particles in a second regeneration stage, in the presence of a fluid containing an excess of oxygen in relation to the stoichiometry of the combustion, at a temperature T_2 greater than T_1 and less than 950° C., in a second regeneration zone distinct from the first one; maintaining the temperature T_2 of the regenerated catalyst particles coming from the second regeneration zone and recycled to the conversion-reaction zone at a value predetermined on the basis of the requirements of the conversion-reaction zone by withdrawing a controlled quantity of catalyst from the second zone and cooling it to a temperature level T_3 lower than T_1; reintroducing the fraction of catalyst so cooled into the fluidized bed of the first regeneration zone; increasing the flow rate of the oxidizing fluid supplying the first regeneration zone between 1 and 50 percent of the normal flow rate of that fluid in the absence of the introduction of the cooled catalyst; and maintaining the temperature of combustion in the first regeneration zone at substantially the value of T_1 through appropriate adjustment of the quantity of oxygen-containing fluid introduced into that chamber.

4,965,233

NOVEL ZEOLITE FLUID CRACKING CATALYSTS AND PREPARATION THEREOF FROM MIXTURES OF CALCINED CLAY

Barry K. Speronello, River Edge, N.J., assignor to Engelhard Corporation, Edison, N.J.

Filed Oct. 20, 1988, Ser. No. 260,433

Int. Cl.[5] B01J 29/08, 21/16; C01B 33/34

U.S. Cl. 502—65 21 Claims

1. The method for making a high zeolite content fluid catalytic cracking catalyst comprising the steps of:

(a) forming an aqueous slurry comprising of a coarse particle size fraction of uncalcined kaolin clay having an average particle size in the range of about 2 to 6 microns;

(b) spray drying the aqueous slurry to obtain porous coherent microspheres;

(c) calcining one portion of the microspheres obtained in step (b) at a temperature and for a time sufficient to convert the hydrated kaolin clay in the microspheres substantially to metakaolin, but insufficient to undergo the characteristic kaolin exotherm;

(d) calcining another portion of the microspheres from step (a) or another batch of microspheres obtained by step (a) at a temperature and for a time sufficient to cause the kaolin to undergo the exothermic kaolin reaction;

(e) mixing the microspheres obtained in steps (c) and (d) in weight proportions of about 20 to 80 parts by weight (c) to 80 to 20 parts by weight (d) with sodium silicate and water to obtain an alkaline slurry of microspheres of calcined clay in an aqueous solution containing sodium silicate;

(f) heating the slurry of microspheres of calcined clay to a temperature and for a time sufficient to crystallize at least about 40% by weight Y-faujasite in the microspheres, said Y-faujasite being in the sodium form;

(g) separating the microspheres containing at least about 40% by weight Y-faujasite from at least a major portion of its mother liquor; and

(h) replacing sodium cations in the microspheres separated in step (g) with ammonium or rare earth cations or both.

17. The fluid catalytic cracking catalyst made by the method of claim 1.

4,965,234

SUPPORTED CATALYST FOR THE PREPARATION OF MONOCARBOXYLIC ANHYDRIDES

Gerhard Luft, Mühltal, and Peter Trabold, Dieburg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Hurth, Fed. Rep. of Germany

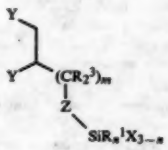
Filed Mar. 3, 1989, Ser. No. 319,138

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1988, 3808868

Int. Cl.[5] B01J *31/00*

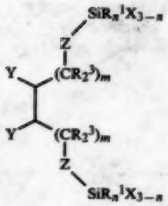
U.S. Cl. 502—154 9 Claims

1. A supported catalyst for the preparation of a monocarboxylic anhydride by carbonylation of the appropriate ester or ether, where, in the supported catalyst, an organosilicon compound containing alkoxy or halogen groups and containing organonitrogen, organophosphorus, organoarsenic, organosulfur or mercapto groups, is bonded, as a polyfunctional coupling agent, on the one hand to a support material and on the other hand to a noble-metal compound from group VIII of the Periodic Table of the Elements, wherein, the coupling agent is a chelate-forming organosilicon compound of the formula



(a)

or



(b)

where

X=—Cl, —Br or —OR^2;

Y=—NR_2^4, a nitrogen-containing aryl radical, —PR_2^4, AsR_2^4, —SR^4 or —SH;

Z=zero, arylene or phenylene;

R^1=C_1 to C_3-alkyl;

R^2=C_1 to C_3-alkyl or —C_6H_5;

R^3=—H or C_1 to C_3-alkyl;

R^4=C_1 to C_6-alkyl, C_5 or C_6-cycloalkyl or —C_6H_5 or —$CH_2C_6H_5$;

n=0 or 1 or 2;

m=2 to 6.

4,965,235

MALEIC ANHYDRIDE CATALYSTS AND PROCESS FOR THEIR MANUFACTURE

Muin S. Haddad, and William S. Eryman, Naperville, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed May 15, 1989, Ser. No. 351,727

Int. Cl.[5] B01J *27/18, 27/198, 27/199*

U.S. Cl. 502—209 35 Claims

1. A catalyst for the production of maleic anhydride by the oxidation of butane which comprises a phosphorus-vanadium mixed oxide prepared in a reaction where the molar ratio of water to phosphorus is in the range of about 2.25:1 to about 3.75:1, the atomic ratio of vanadium to phosphorus being in the range of about 0.5:1 to about 1.25:1 and wherein the resulting catalyst syrup is rapidly dried so that the syrup reaches a temperature of at least about 150° C. in less than about 10 hours wherein the resulting catalyst in the production of maleic anhydride from butane does not expand.

4,965,236

PROCESS FOR PRODUCING A CATALYST

John S. Roberts, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 908,558, Sep. 18, 1986, Pat. No. 4,837,192, which is a continuation-in-part of Ser. No. 742,818, Jun. 10, 1985, abandoned, which is a division of Ser. No. 542,960, Oct. 18, 1983, Pat. No. 4,537,994. This application Apr. 10, 1989, Ser. No. 335,651

Int. Cl.[5] B01J *27/18, 27/19*

U.S. Cl. 502—211 11 Claims

1. A process to produce a catalyst that is useful for interactions between organic sulfides and mercaptans, which process comprises the steps:

(a) adding a moderately acidic aluminum containing support to a solution of phospho Group VIB oxide acid in polar diluent;

(b) mixing the material from said step (a) for a sufficient length of time to allow said phospho Group VIB oxide acid to react and impregnate onto said moderately acidic aluminum containing support, thereby forming a supported catalyst;

(c) drying said supported catalyst of said step (b) thereby forming a dried catalyst; and

(d) sulfiding said dry catalyst of said step (c) under conditions sufficient to fully sulfide the catalyst,

wherein said phospho Group VIB oxide acid is within the range of about 0.01 to about 10 weight percent based on the total weight of the catalyst.

4,965,237

THERMAL PRINTING MATERIAL

Shigetoshi Hiraishi, Tokyo, and Kazuo Kabashima, Yokohama, both of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo and Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, both of, Japan

PCT No. PCT/JP87/00300, § 371 Date Dec. 31, 1987, § 102(e) Date Dec. 31, 1987, PCT Pub. No. WO87/06885, PCT Pub. Date Nov. 19, 1987

PCT Filed May 13, 1987, Ser. No. 146,828

Claims priority, application Japan, May 14, 1986, 61-108670; Sep. 10, 1986, 61-211692; Sep. 10, 1986, 61-211693; Nov. 11, 1986, 61-266695; Nov. 12, 1986, 61-267697; Feb. 6, 1987, 62-24668; Apr. 17, 1987, 62-93258

Int. Cl.[5] B41M *5/18*

U.S. Cl. 503—209 14 Claims

1. A thermal printing material comprising a substrate and a thermal printing layer formed thereon comprising an aromaticity-possessing isocyanate compound, an imino compound having at least one >C=NH group which reacts with said aromaticity-possessing isocyanate compound on heating to produce color, and one or more aniline derivatives having at least one unsubstituted amino group.

4,965,238

THERMAL DYE TRANSFER RECEIVING ELEMENT WITH SUBBING LAYER FOR DYE IMAGE-RECEIVING LAYER

Richard P. Henzel, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 11, 1989, Ser. No. 449,628

Int. Cl.[5] B41M *5/035, 5/26*

U.S. Cl. 503—227 20 Claims

13. In a process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye-containing layer and thereby transferring a dye image to a dye-receiving element to form said dye transfer image, said dye receiving element comprising a polyolefin support having thereon a polymeric dye image-receiving layer

and a subbing layer between said polyolefin support and said dye image-receiving layer, the improvement wherein said subbing layer comprises a polymer having an inorganic backbone which is an oxide of zirconium.

4,965,239

THERMAL DYE TRANSFER RECEIVING ELEMENT WITH SUBBING LAYER FOR DYE IMAGE-RECEIVING LAYER

Richard P. Henzel, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 11, 1989, Ser. No. 449,661
Int. Cl.[5] B41M *5/035, 5/26*
U.S. Cl. 503—227 **20 Claims**

13. In a process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye-containing layer and thereby transferring a dye image to a dye-receiving element to form said dye transfer image, said dye receiving element comprising a polyolefin support having thereon a polymeric dye image-receiving layer and a subbing layer between said polyolefin support and said dye image-receiving layer, the improvement wherein said subbing layer comprises a polymer having an inorganic backbone which is an oxide of titanium.

4,965,240

IMAGE-RECEIVING SHEET

Kazunobu Imoto, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Feb. 8, 1989, Ser. No. 307,475
Claims priority, application Japan, Feb. 12, 1988, 63-30594
Int. Cl.[5] B41M *5/035, 5/26*
U.S. Cl. 503—227 **6 Claims**

1. An image-receiving sheet to be used in combination with a heat transfer sheet containing a dye which is migrated by melting or sublimation with heat, having a receiving layer for receiving the dye migrated from said heat transfer sheet formed on the surface of the substrate sheet, said receiving layer having dyeability, and the surface reflection characteristics of the surface of the image-receiving sheet where the receiving layer is coated having the values L, a and b as measured by the method defined by JIS-Z8722 and represented by JIS-8730 within the ranges of L=85 or more, a=−1.5 to +2.0, and b=abut −4.0 to 0, respectively.

4,965,241

THERMAL DYE TRANSFER RECEIVING ELEMENT WITH SUBBING LAYER FOR DYE IMAGE-RECEIVING LAYER

Richard P. Henzel, Webster, and Daniel J. Harrison, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 11, 1989, Ser. No. 449,631
Int. Cl.[5] B41M *5/035, 5/26*
U.S. Cl. 503—227 **20 Claims**

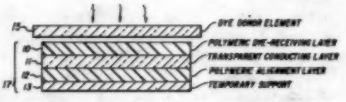
14. In a process of forming a dye transfer image comprising imagewise heating a dye-donor element comprising a support having thereon a dye-containing layer and thereby transferring a dye image to a dye-receiving element to form said dye transfer image, said dye-receiving element comprising a polyolefin support having thereon a polymeric dye image-receiving layer and a subbing layer between said polyolefin support and said dye image-receiving layer, the improvement wherein said subbing layer comprises a polymer having a silicon oxide backbone and at least one aminofunctional substituent.

4,965,242

METHOD OF MAKING COLOR FILTER ARRAY FOR LIQUID CRYSTAL DISPLAY

Charles D. DeBoer, Rochester, and Richard T. Klingbiel, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 11, 1989, Ser. No. 449,623
Int. Cl.[5] B41M *5/35*
U.S. Cl. 503—227 **10 Claims**



1. A process of preparing a color filter array element for use in making a color liquid crystal display device comprising:

(a) overlaying a dye receiving element with a dye-donor element, said dye-receiving element comprising a dimensionally-stable temporary support having thereon, in order, a polymeric alignment layer, a transparent conducting layer and a dye receiving layer;

(b) imagewise heating said dye-donor element to transfer a dye image in a repeating mosaic pattern to said dye-receiving layer;

(c) removing said dye donor element from contact with said dye receiving element;

(d) laminating a transparent permanent support to said dye-receiving layer containing said dye image in a repeating mosaic pattern; and

(e) removing said temporary support to expose one surface of said polymeric alignment layer, thereby forming said color filter array element.

4,965,243

PROCESS FOR PRODUCING A CATALYST FOR PURIFYING EXHAUST GASES FROM INTERNAL COMBUSTION ENGINES

Teiji Yamada, and Masaki Funabiki, both of Shizuoka, Japan, assignors to Engelhard Corporation, Edison, N.J.

Continuation of Ser. No. 234,226, Aug. 19, 1988, abandoned. This application Feb. 9, 1990, Ser. No. 478,040
Claims priority, application Japan, Aug. 28, 1987, 62-213159
Int. Cl.[5] B01J *21/04, 21/06, 23/10, 23/58*
U.S. Cl. 502—304 **13 Claims**

1. A process for producing an exhaust gas purifying catalyst by depositing a slurry containing at least one platinum-group element, active alumina, cerium oxide, a barium compound and a zirconium compound as catalyst ingredients on a monolithic support and calcining the support having the catalyst ingredient deposited thereon, which comprises

(a) a step of preparing active alumina containing the platinum-group element,

(b) a step of preparing a slurry containing the platinum-group element and active alumina from step (a), cerium oxide, the barium compound and the zirconium compound, and

(c) a step of depositing the slurry on the monolithic support, followed by calcination.

4,965,244

CaF_2 PASSIVATION LAYERS FOR HIGH TEMPERATURE SUPERCONDUCTORS

John H. Weaver, Golden Valley, Minn.; Robert K. Grasselli, Aurora, Ohio; David L. Nelson, Falls Church, Va.; Harry M. Meyer, III, Coon Rapids, and Donald M. Hill, Minneapolis, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Sep. 19, 1988, Ser. No. 246,100
Int. Cl.[5] B05D 5/12
U.S. Cl. 505—1 7 Claims

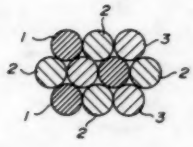
1. A method comprising applying a passivation layer of CaF_2 to the surface of a superconductive ceramic oxide by evaporation, wherein said CaF_2 layer is effective to passivate said oxide surface without disrupting the superconductive properties.

4,965,245

METHOD OF PRODUCING OXIDE SUPERCONDUCTING CABLES AND COILS USING COPPER ALLOY FILAMENT PRECURSORS

Masaru Sugimoto; Osamu Kohno; Yoshimitsu Ikeno; Nobuyuki Sadakata; Mikio Nakagawa; Shin'ya Aoki; Masayuki Tan; Ryuichi Okiai; Syotaro Yoshida; Masakazu Hasegawa, and Hiroshi Yamanouchi, all of Tokyo, Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed Jul. 15, 1988, Ser. No. 219,433
Claims priority, application Japan, Jul. 17, 1987, 62-178352; Jul. 24, 1987, 62-184903; Aug. 8, 1987, 62-198913
Int. Cl.[5] H01L 39/24
U.S. Cl. 505—1 13 Claims



1. A method of producing a superconducting coil, comprising an A-B-C-D system superconductor, wherein A is one or more elements selected from the group consisting of Sr, Mg, Ca and Ba; B is one or more elements selected from the group consisting of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu; C is copper and D is oxygen, which method comprises:

(a) selecting a plurality of copper alloy filaments, such that a superconductor is formed upon subsequent heat treatment, from the group consisting of:

(i) a copper alloy filament including at least one A element, and a copper alloy filament including at least one B element;

(ii) a copper alloy filament including both elements A and B;

(iii) a first copper alloy filament having particles of a copper oxide dispersed therein;

(iv) a second copper alloy filament coated with an oxide layer;

(v) a copper alloy filament containing at least one A element and having particles of a copper oxide dispersed therein;

(vi) a copper alloy filament containing at least one B element and having particles of a copper oxide dispersed therein;

(vii) a third copper alloy filament containing an A element and being coated with an oxide layer; and

(viii) a fourth copper alloy filament containing a B element and being coated with an oxide layer; the first to fourth copper alloy filaments being substantially free of any component which adversely effects the production of the superconductor;

(b) arranging the selected filaments to form at least one filaments bundle;

(c) drawing at least one filaments bundle and then forming a bundle assembly; and

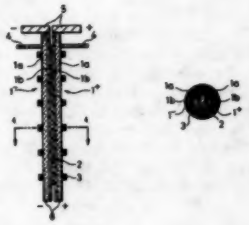
(d) heating the drawn bundle assembly under an oxidizing atmosphere, thereby producing the superconductor, the filaments bundle having a substantially uniform crystal structure along the entire length thereof.

4,965,246

CURRENT-CARRYING LEAD FORMED OF A CERAMIC SUPERCONDUCTIVE MATERIAL CARRIED BY A SUPPORT

Chizuru Suzawa, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 28, 1988, Ser. No. 174,468
Claims priority, application Japan, Mar. 31, 1987, 62-80401; Mar. 31, 1987, 62-80408
Int. Cl.[5] H01B 12/00; H01F 5/08
U.S. Cl. 505—1 12 Claims



1. A current-carrying lead for connection between a source of current supply and a superconducting device, comprising at least two parallel ceramic superconductors,

a longitudinal support for each superconductor, and

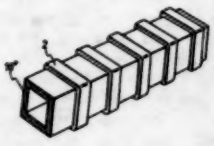
a spacer that is disposed between said supports in their longitudinal direction and a plurality of retains that are provided around the circumference of said ceramic superconductors, said retainers being spaced along the longitudinal dimension of said supports to retain said spacer, supports and superconductors in position.

4,965,247

SUPERCONDUCTING COIL AND A METHOD FOR PRODUCING THE SAME

Masanori Nishiguchi, Kanagawa, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 5, 1988, Ser. No. 215,288
Claims priority, application Japan, Jul. 6, 1987, 62-168358
Int. Cl.[5] B23B 3/00
U.S. Cl. 505—1 18 Claims



1. A superconducting coil comprising a support and at least one ring-shaped or spiral turn of a superconductor, wherein said at least one ring-shaped or spiral turn is previously cut on

an outer surface of said support so that a superconducting material is received on a groove, which is composed of a compound oxide represented by the formula:

$$(\alpha_{1-x}\beta_x)\gamma_y O_z$$

in which α stands for an element selected from group IIa of the Periodic Table, β stands for an element selected from group IIIa of the Periodic Table and an element γ stands for an element selected from the group comprising group Ib, IIb, IIIb, IVb and VIII of the Periodic Table, and x, y, and z are numbers each having a range of $0.1 \leqq x \leqq 0.9$, $1.0 \leqq y \leqq 4.0$ and $1 \leqq z \leqq 5$, respectively and is supported on a surface of said support.

4,965,248

METHOD OF FABRICATING THIN LAYERS FROM HIGH-TEMPERATURE OXIDE SUPERCONDUCTORS

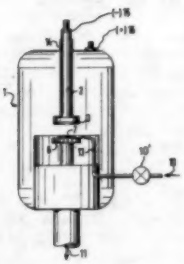
Ulrich Poppe; Jürgen Schubert, both of Cologne, and Wilhelm Evers, Jülich, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Fed. Rep. of Germany

Filed Feb. 13, 1989, Ser. No. 310,698

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1988, 3805010; European Pat. Off., Dec. 7, 1988, 88 120397.0

Int. Cl.[5] C23C *14/08*

U.S. Cl. 505—1 **16 Claims**



1. A method of making a thin-layer superconductor body, comprising the steps of:

(a) heating a substrate;

(b) juxtaposing a cathodically poled target composed of a high-transition-temperature oxide with a critical temperature greater than 77 degrees K superconductor with said substrate;

(c) providing an atmosphere ionized by glow discharge around said substrate and said target;

(d) effecting cathodic atomization of said target and deposition of cathodically atomized material from said target onto the heated substrate in the presence of said atmosphere to form a thin-layer superconductor body on said substrate; and

(e) maintaining a partial pressure of oxygen in said atmosphere of at least 67 Pa and sustaining reactive cathodic deposition of said high-temperature oxide superconductor on ssid substrate.

4,965,249

METHOD OF MANUFACTURING A SUPERCONDUCTING WIRE

Gijsbertus De With, and Jan W. Severin, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 126,393, Nov. 30, 1987, abandoned. This application Sep. 23, 1988, Ser. No. 249,634

Claims priority, application Netherlands, Oct. 2, 1987, 8702351

Int. Cl.[5] H01B *12/00*

U.S. Cl. 505—1 **9 Claims**

1. A method of manufacturing a wire of a superconducting oxide material comprising forming an essentially cylindrical preform comprising a rod-shaped filament (F) product embedded in, and surrounded by a matrix (M) product, the F and the M products both containing a binder in which pulverulent oxidic materials are dispersed, the pulverulent oxidic material present in the F product and the pulverulent oxidic material present in the M product being capable of reacting, in a solid state reaction, with each other to form a superconducting oxidic material of the formula $YBa_2Cu_3O_{7-\gamma}$, where $\gamma = 0.1 + 0.5$, extruding said preform to form a wire of desired diameter, heating said wire to decompose and bake out said binder, then sintering said wire to thereby cause the pulverulent oxidic material present in the F product and pulverulent oxidic material present in the M product to react with each other at the interface of the F product and the M product and form said superconducting oxidic material.

4,965,250

PEPTIDE COMPOUNDS HAVING A NITROGENOUS POLYCYCLIC STRUCTURE

Michel Vincent, Bagneux; Georges Rémond, Versailles, and Claude Cudennec, LaCelle St-Cloud, all of France, assignors to Adir ET CIE, Neuilly-sur-Seine, France

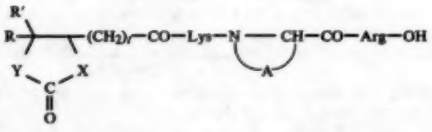
Filed Jan. 25, 1988, Ser. No. 148,027

Claims priority, application France, Feb. 13, 1987, 87 01810

Int. Cl.[5] A61K *37/02*; C07K *5/10*

U.S. Cl. 514—18 **14 Claims**

1. A compound selected from those of the formula:



I

in which

R denotes:

a hydrogen atom,

a straight- or branched-chain alkyl radical containing from 1 to 4 carbon atoms,

phenyl or thienyl, optionally substituted with a hydroxy, amino, mercapto, methylthio or lower alkyl group,

benzyl,

R' denotes a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 4 carbon atoms,

X denotes an oxygen atom or an NH group,

Y denotes an oxygen or sulfur atom when X denotes an NH

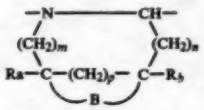
group, or Y denotes an NH group when X denotes an oxygen atom,

t denotes 0 or 1,

Lys and Arg denote, respectively, lysyl and arginyl residues engaged in peptide bonds,

denotes

a bicyclic structure of the formula:



where

m equals 1 or zero,

n and p denote zero, 1 or 2,

R_a and R_b denote a hydrogen atom or can form together a direct bond when p=0,

B denotes an alkylene chain $(CH_2)_q$ where q equals 2, 3 or 4

or an unsaturated structure $(—CH=CH—)_2$ when p=0 and R_a and R_b together form a bond, with the proviso that the sum of m, n, p and q is an integer between 3 and 6, or

1,2,3,4-tetrahydro-beta-carboline, or an enantiomer, epimer, or diastereoisomer thereof, or an addition salt of any of the foregoing with a pharmaceutically-acceptable acid or base.

4,965,251

PULSE TREATMENT OF HEMOGLOBINOPATHIES WITH ERYTHROPOIETIN

George Stamatoyannopoulos, Seattle, Wash., assignor to The Board of Regents of The University of Washington, Seattle, Wash.

Filed Apr. 3, 1987, Ser. No. 34,309
Int. Cl.[5] A61K *37/02*
U.S. Cl. 514—8 **13 Claims**

1. A method of obtaining an increase in F-reticulocyte production in a patient comprising treating the patient with a plurality of treatment regimens, each treatment regimen having a duration of from about 7 to about 20 days and comprising a first time period having a duration of about one to about three days wherein at least about 500 I.U. of erythropoietin per kg of body weight is administered to the patient and a second time period during which erythropoietin is withheld from the patient.

4,965,252

CHOLESTEROL-LOWERING COMBINATION COMPOSITIONS OF GUAR GUM AND NIACIN

Eric H. Kuhrts, Santa Barbara, Calif., assignor to Hauser-Kuhrts, Inc., Santa Barbara, Calif.

Filed Jun. 28, 1988, Ser. No. 212,715
Int. Cl.[5] A61K *31/33, 31/715*
U.S. Cl. 514—54 **31 Claims**

1. An oral antihyperlipidemic composition of nicotinic acid, having a reduced flushing effect, comprising an effective antihyperlipidemic amount of nicotinic acid and an effective cutaneous-flushingreducing amount of guar gum.

4,965,253

VISCOELASTIC MATERIAL FOR OPHTHALMIC SURGERY

Eugene P. Goldberg, and Moshe Yalon, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed Oct. 14, 1987, Ser. No. 108,068
Int. Cl.[5] A61K *31/00*
U.S. Cl. 514—54 **19 Claims**

1. A composition particularly adapted for use as an ophthalmic viscoelastic surgical material in the anterior or posterior chamber of the eye consisting of an aqueous solution containing at least about 1.5% to about 25%, by weight, of a physiologically acceptable, water-soluble polyvinylpyrrolidone polymer or polyvinylpyrrolidone copolymer, having a molecular weight greater than 500,000, said aqueous solution having a viscosity greater than about 5,000 centipoises, measured at 25° C. using a Brookfield viscometer.

4,965,254

AGENTS FOR COMBATING PESTS

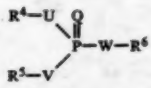
John Anderson; Bernhard Homeyer, both of Leverkusen; Engelbert Kühle, Bergisch-Gladbach; Hans Scheinpflug, Leverkusen, all of Fed. Rep. of Germany; Walter M. Zeck, and Donald E. Simonet, both of Vero Beach, Fla., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany and Mobay Corporation, Pittsburgh, Pa.

Division of Ser. No. 798,216, Nov. 14, 1985, Pat. No. 4,656,163, which is a division of Ser. No. 701,476, Feb. 14, 1985, Pat. No. 4,603,214. This application Sep. 25, 1986, Ser. No. 911,587
Int. Cl.[5] A01N *37/34, 53/00, 57/00, 57/18*
U.S. Cl. 514—89 **18 Claims**

1. A soil pesticide composition for soil application displaying an enhancing duration activity comprising

(a) a pesticidally effective amount of a nematicide or insecticide selected from the group consisting of

(i) a P-ester of the formula



(II)

in which

Q represents oxygen or sulphur,

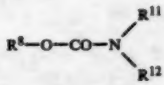
U, V, and W are identical or different and represent oxygen or sulphur, it moreover also being possible for one of the radicals U, V and W to denote a direct bond or the -NH-group,

R^4 and R^5 are identical or different and represent C_1–C_4-alkyl and

R^6 represents C_1–C_5-alkyl, which can be substituted by C_1–C_4-alkylthio or halogen, C_2–C_4-alkenyl, which can be substituted by halogen or halogenophenyl, phenyl, which can be substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkoxycarbonyl, pyridyl, which can be substituted by halogen, pyrimidinyl, which can be substituted by C_1–C_4-alkyl, C_3–C_6-cycloalkyl or phenyl, 5-chloro-1-(1-methylethyl)-1H-1,2,4-triazol-3-yl, or —N=CR^7 (CN), wherein

R^7 denotes phenyl which is unsubstituted or substituted by halogen, and

(ii) a carbamate of the formula



(III)

in which

R^8 represents phenyl, which can be substituted by

C_1–C_4-alkylthio-C_1–C_4-alkyl, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, 2,3-dihydro-2,2-dimethyl-7-benzofuranyl, or —N=CR^9R^{10}, in which

R^9 denotes C_1–C_4-alkyl, which can be substituted by C_1–C_4-alkylthio, or CON (C_1–C_4-alklyl)$_2$,

R^{10} denotes hydrogen or C_1–C_4-alkylthio,

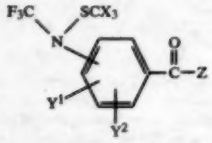
R^{11} represents C_1–C_4-alkyl, and

R^{12} denotes hydrogen or —S—$NR^{13}R^{14}$, in which

R^{13} denotes C_1–C_4-alkyl and

R^{14} denotes $COOC_1$–C_4-alkyl or C_1–C_4-alkyl, which can be substituted by COO-C_1–C_4-alkyl, and

(b) an effective amount sufficient to increase the duration of activity of said nematicide or insecticide in the soil of a sulphenic acid amide of the formula



in which

X denotes a halogen atom which need not be identical in all three occurrences,

Y^1 denotes hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, NO_2 or halogen substituted C_1–C_4-alkyl,

Y^2 denotes hydrogen or halogen,

Z denotes halogen, —OH, —NHOH, OR^1, or

R^1 denotes unsubstituted phenyl or phenyl substituted by halogen or C_1–C_4-alkoxycarbonyl; or unsubstituted thienyl or thienyl substituted by C_1–C_4-alkyl or C_1–C_4-alkoxycarbonyl, and

R^2 and R^3 each independently denotes hydrogen, unsubstituted C_1–C_4-alkyl or C_1–C_4-alkyl substituted by halogen, C_1–C_4-alkoxy or CN,

wherein the weight ratio of nematicide or insecticide to sulphenic acid amide is between about 10:1 and 1:50.

4,965,255

CARBOXIMIDE CONTAINING AGENTS FOR COMBATING PESTS

John Anderson, Langenfeld; Bernhard Homeyer, Leverkusen, both of Fed. Rep. of Germany, and Walter M. Zeck, Vero Beach, Fla., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany and Mobay Corporation, Pittsburgh, Pa.

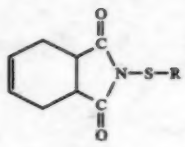
Filed Dec. 5, 1986, Ser. No. 938,212

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1985, 3545059

Int. Cl.[5] A01N *43/38, 57/00, 57/26*

U.S. Cl. 514—123 **6 Claims**

1. A soil pesticide composition having an enhanced period of activity comprising an effective amount of a soil pesticide selected from the group consisting of isofenphos and fenamiphos and an effective amount for enhancing the period of activity of said pesticide, an extender of the formula



in which R denotes —CCl_3 or —CCL_2—$CHCl_2$ wherein the weight ratio of pesticide to extender is between 10:1 and 1:50.

4,965,256

FLUBENZIMINE CONTAINING AGENTS FOR COMBATING PESTS

John Anderson, Langenfeld; Bernhard Homeyer, Leverkusen, both of Fed. Rep. of Germany, and Walter M. Zeck, Vero Beach, Fla., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany and Mobay Corporation, Pittsburgh, Pa.

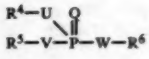
Filed Dec. 5, 1986, Ser. No. 938,675

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1985, 3545060

Int. Cl.[5] A01N *43/78, 57/00, 57/26*

U.S. Cl. 514—128 **11 Claims**

1. A pesticidal composition for soil application displaying an enhanced duration of activity comprising an effective amount of a soil pesticide P-ester of the formula



in which

Q represents oxygen or sulphur,

U, V, and W are identical or different and represent oxygen or sulphur, it moreover also being possible for one of the radicals U, V, and W to denote a direct bond or the —NH— group,

R^4 and R^5 are identical or different and represent C_1–C_4-alkyl and

R^6 represents C_1–C_5-alkyl, which can be substituted by C_1–C_4-alkylthio or halogen, C_2–C_4-alkenyl, which can be substituted by halogen or halogenophenyl, phenyl, which can be substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkylthio, C_1–C_4-alkylsulphiyl or C_1–C_4-alkoxycarbonyl, pyridyl, which can be substituted by halogen, pyrimidinyl, which can be substituted by C_1–C_4-alkyl, C_3–C_6-cycloalkyl or phenyl,5-chloro-1-(1-methyl- ethyl)-1H-1,2,4,-triazol-3-yl, or —N=CR^7 (CN),

wherein

R^7 denotes phenyl which is unsubstituted or substituted by halogen,

and an effective amount for enhancing the period of activity of said pesticide, flubenzimine wherein the weight ratio of P-ester to flubenzimine is between about 1:50 and 50:1.

4,965,257

PESTICIDAL COMPOUNDS

John E. Casida, Berkeley, Calif.; Christopher J. Palmer, Ipswich, England; John P. Larkin, Leighton Buzzard, England, and Ian H. Smith, Eaton Bray, England, assignors to The Regents of the University of California, Berkeley, Calif.

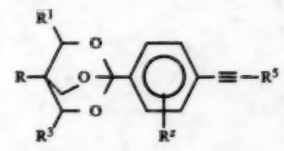
Continuation of Ser. No. 910,089, Sep. 22, 1986, abandoned, which is a continuation-in-part of Ser. No. 779,167, Sep. 23, 1985, Pat. No. 4,772,624, which is a continuation-in-part of Ser. No. 692,818, Jan. 23, 1984, abandoned, which is a continuation-in-part of Ser. No. 575,843, Jan. 30, 1984, abandoned. This application Jul. 24, 1989, Ser. No. 384,067

Claims priority, application United Kingdom, Sep. 24, 1985, 8523582; Jun. 1, 1986, 8600201; Dec. 3, 1986, 8606131

Int. Cl.[5] A01N *57/00*; A61K *31/655*

U.S. Cl. 514—149 9 Claims

1. A compound of the formula:



wherein

R is C_{2-4} alkyl, alkenyl or alkynyl, or C_{2-10} alkyl, alkenyl or alkynyl substituted by cyano, halo, C_{3-4} cycloalkyl, C_{1-4} alkoxy, or a group $S(O)_mR^4$ where R^4 is C_{1-4} alkyl or phenyl, each optionally substituted by C_{1-4} alkoxy, C_{1-3} alkyl, C_{2-4} alkynyl, halo, cyano or a group $S(O)_mR^4$ as defined above;

R^1 and R^3, which are the same or different, are each hydrogen, halo, C_{1-3} alkyl, C_{2-3} alkenyl or alkynyl, the alkyl, alkenyl or alkynyl each substituted by halo, cyano or a group C_{1-4} alkoxy; alkyl carbalkoxy containing up to 6 carbon atoms, a group $S(O)_mR^4$ as defined above or alkynyl substituted by tri-C_{1-4} alkysilyl, or R^1 is COO-C_{1-4}-alkyl, cyano, gem-dimethyl, gem-dicyano, gem-dihalo, gem-diethynyl, spirocyclopropyl, spiro-oxirane or spiro-oxetane, substituted spiro-oxirane or spiro-oxetane, oxo or methylene optionally substituted by cyano or halo or $—CF_3$ or R^1 and R and the carbon atoms to which they are attached from a C_{5-7} carbocyclic ring or a carbocyclic ring substituted by C_{1-3} alkyl, C_{1-3} alkoxy or C_{2-3} alkenyl;

R^2 is 1 to 4 groups each selected from hydrogen, halo, cyano, azido, nitro, C_{1-3} alkyl or alkoxy, C_{1-3} alkyl or alkoxy substituted by halo, C_{2-3} alkenyl or alkynyl, or C_{2-3} alkenyl or alkynyl substituted by halo; and

R^5 is bromine, chlorine, iodine, a group $S(O)_mR^{4x}$ wherein R^{4x} is trifluoromethyl or a group R^4 as defined above, methyl or ethyl optionally substituted by hydroxy, a group OSO_2R^{10x} wherein R^{10x} is C_{1-4} alkyl, phenyl or tolyl, C_{1-4} alkoxy, C_{1-4} acyloxy optionally substituted by an amino group mono or di substituted by C_{1-4} alkyl groups or mono-substituted by phenyl optionally substituted by one to three halogen atoms, a group $NR^{11}R^{12}$ wherein R^{11} is hydrogen or C_{1-4} alkyl, R^{12} is hydrogen, C_{1-4} alkyl or a group COR [13] wherein R^{13} is C_{1-4} alkyl or alkoxy, a group $CX.R^6$ where X is oxygen or sulfur and R^6 is a C_{1-6} hydrocarbyl or C_{1-6} hydrocarbyloxy group optionally substituted by fluoro or an amino group optionally substituted by one or two C_{1-4} alkyl groups or R^5 is cyano, or a silyl group substituted by three C_{2-4} alkyl groups or two C_{1-4} alkyl groups and a phenyl group.

4,965,258

CYCLOALKANO(1,2-B)INDOLE-SULPHONAMIDES, PHARMACEUTICAL COMPOSITIONS AND USE

Horst Böshagen, Haan; Ulrich Rosentreter, Wuppertal; Folker Lieb, Leverkusen; Hermann Oediger, Cologne; Friedel Seuter, Wuppertal; Elisabeth Perzborn, Wuppertal, and Volker-Bernd Fiedler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

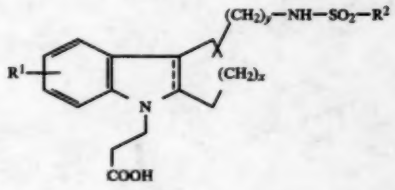
Division of Ser. No. 308,152, Feb. 8, 1989, Pat. No. 4,904,797, which is a division of Ser. No. 212,840, Jun. 29, 1988, Pat. No. 4,827,032, which is a continuation of Ser. No. 13,302, Feb. 10, 1987, abandoned. This application Nov. 23, 1989, Ser. No. 442,043

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1986, 36055662; Sep. 19, 1986, 36318248

Int. Cl.[5] A61K *31/40*; C07D *209/70, 209/86, 209/88*

U.S. Cl. 514—158 9 Claims

1. A cycloalkano[1,2-b]indole-sulphonamide of the formula



in which

R^1 represents hydrogen, halogen, trifluoromethyl, carboxyl or alkoxycarbonyl; or represents a group of the formula $—S(O)_mR^3$,

in which

R^3 denotes alkyl or aryl, and

m denotes one of the numbers 0, 1 or 2; or represents a group of the formula

in which

R^4 and R^5 each independently represent hydrogen, alkyl, aryl, aralkyl or acetyl; or represents a group of the formula $—OR^6$,

in which

R^6 denotes hydrogen, alkyl, aryl, aralkyl, alkyl-SO_2—, aryl—SO_2—, aralkyl—SO_2— or trifluoromethyl; or represents alkyl, alkenyl or cycloalkyl, each of which is optionally substituted by carboxyl, alkoxycarbonyl, halogen, hydroxyl, alkoxy, alkylthio or cyano,

R^2 represents aryl which is optionally substituted up to 5 times by halogen, cyano, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, alkyl, carboxyalkyl, alkoxycarbonylalkyl, alkoxy, alkylthio, hydroxyl, carboxyl, alkoxycarbonyl, phenyl, phenoxy, benzyloxy, benzylthio or by a group of the formula

in which

R^4 and R^5 have the abovementioned meaning,

x represents the number 1, 2 or 3, and

y represents the number 0 or 1,

where appropriate in an isomeric form, and salts thereof.

9. A method of inhibiting platelet aggregation or antagoniz-

ing thromboxane A_2 comprising administering to a patient in need of such treatment an amount effective to inhibit aggregation platelets or to antagonize thromboxane A_2 of a cycloalkano-indole-sulphonamide according to claim 1.

4,965,259

DIOXAZOCINE DERIVATIVES COMPOSITIONS AND METHODS CONTAINING THEM HAVING ANTIDEPRESSIVE, SPASMOLYTIC, ANTICONVULSIVE, AND ANTIARRHYTHMIC PROPERTIES

László Rózsa; Lujza Petőcz; Enikő Szirt née Kiszelly; Márton Fekete; Mária Szécsey née Hegedüs; Gábor Gigler, and István Gacsályi, all of Budapest, Hungary, assignors to EGIS Gyógyszergyár, Budapest, Hungary

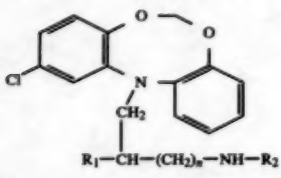
Filed Dec. 30, 1988, Ser. No. 292,450

Claims priority, application Hungary, Dec. 31, 1987, 6170/87

Int. Cl.[5] A61K *31/395;* **C07D** *273/01*

U.S. Cl. 514—183 **13 Claims**

1. A compound of the formula I



(I)

wherein

R_1 represents hydrogen or methyl,

R_2 represents an alkyl having from 1 to 3 carbon atoms, and n is equal to 1, and pharmaceutically acceptable acid addition salts thereof formed with an inorganic or organic acid.

9. A pharmaceutical composition having antidepressive, spasmolytic, anticonvulsive and antiarrhythmic properties which comprises an effective amount of the compound or salt as defined in claim 5 and a pharmaceutically acceptable carrier or excipient.

4,965,260

BICYCLIC BETA-LACTAM CARBOXYLIC ACIDS

Marc Lang, Rixheim, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

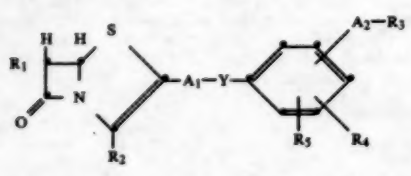
Filed Feb. 8, 1988, Ser. No. 153,377

Claims priority, application Switzerland, Feb. 11, 1987, 498/87; Sep. 3, 1987, 3373/87

Int. Cl.[5] C07D *499/00;* **A61K** *31/425*

U.S. Cl. 514—192 **8 Claims**

1. A compound of the formula



(I)

in which R_1 is hydroxymethylor 1-hydroxyethyl, R_2 is carboxy or esterfied carboxy that is cleavable under physiological conditions, R_3 is hydrogen, amino or amino monoor di-substituted by lower alkyl; lower alkoxy or halogen; each of R_4 and R_5 represents hydrogen, Y represents a group —O—, A_1 is lower alkylene and A_2 represents a direct bond or lower alkylene, and pharmaceutically acceptable salts thereof.

4,965,261

SUBSTITUTED BENZOXAZINORIFAMYCIN DERIVATIVE AND ANTIBACTERIAL AGENT CONTAINING THE SAME

Fumihiko Kanoo, Takasago; Takehiko Yamane, Akashi; Hideo Kondo; Takuji Hashizume, both of Takasago; Katsuji Yamashita, Kobe; Kazunori Hosoe, Takasago; Fumiyuki Kuze, Kyoto, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

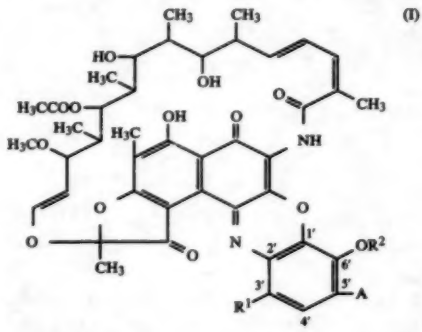
Filed Mar. 16, 1989, Ser. No. 324,499

Claims priority, application Japan, Mar. 18, 1988, 63-67014; Sep. 24, 1988, 63-239288

Int. Cl.[5] A61K *31/535;* **C07D** *521/00*

U.S. Cl. 514—229.5 **7 Claims**

7. An antibacterial composition comprising an inert pharmaceutical carrier and a rifamycin derivative having the formula (I):



(I)

wherein R^1 is hydrogen atom, methyl group or ethyl group, R^2 is an alkyl group having 1 to 4 carbon atoms, and A is a group having the formula:

in which n is an integer of 3 to 5, or a group having the formula:

in which R^3 is an alkyl group having 1 to 5 carbon atoms; or a pharmacologically acceptable salt thereof.

4,965,262

METHOD FOR TREATING OR PREVENTING LOCALLY PERIODONTAL DISEASE

Shigeru Kametaka, Kashiwara; Tadaaki Miyazaki, Osaka; Shinichi Hayashi, Fujiidera; Akira Handa, Funabashi, and Kinya Kameda, Narashino, all of Japan, assignors to Rohto Pharmaceutical Co., Ltd., Osaka and Dalichi Pharmaceutical Co., Ltd., Tokyo, both of, Japan

Filed Feb. 24, 1988, Ser. No. 159,905

Claims priority, application Japan, Feb. 26, 1987, 62-43391

Int. Cl.[5] A61K *7/16*

U.S. Cl. 514—230.2 **2 Claims**

1. A method for treating periodontal disease which comprises administering topically by insertion into a periodontal

pocket an effective amount of ofloxacin or salt thereof to treat periodontal tissue to a patient in need of such treatment.

4,965,263

6-ACYLAMINOPHENYL-5-ALKYL-4,5-DIHYDRO-3(2H)-PYRIDAZINONE COMPOUNDS USEFUL AS BLOOD PRESSURE DEPRESSANTS, ANTITHROMBOTIC AGENTS AND IN THE TREATMENT OF HEART DISEASE

Takashi Nishina; Joji Kamiya; Yasuhito Tanaka, all of Mobara; Tsutomu Katakami; Nobuyuki Fukazawa, both of Yokohama; Hajime Iizuka, Hiratsuka, and Takuo Nakano, Yokohama, all of Japan, assignors to Mitsui Toatsu Kagaku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 913,687, Sep. 25, 1986, abandoned, which is a division of Ser. No. 504,039, Jun. 3, 1983, Pat. No. 4,639,451. This application Feb. 14, 1989, Ser. No. 310,505

Claims priority, application Japan, Oct. 20, 1981, 56-166437; Oct. 20, 1981, 56-166438; Dec. 28, 1981, 56-209937

Int. Cl.[5] A61K *31/50;* **C07D** *237/02, 401/10, 403/10*

U.S. Cl. 514—247 **3 Claims**

1. A method for treating circulatory conditions comprising administering to a patient an effective blood pressure depressing, platelet aggregation inhibiting, or myocardial-contraction reinforcing amount of a compound selected from the group consisting of 6-[4-(N-carbobenzoxy-L-phenylalanylamino)-phenyl]-5methyl-4,5-dihydro-3(2H)-pyridazinone, 6-[4-(L-phenylalanylamino)-phenyl -5-methyl-4,5-dihydro-3(2H)-pyridazinone, 6-[4-N-carbobenzoxy-L-tryptophylamino)-phenyl]-5-methyl-4,5-dihydro-3(2H)-pyridazinone, 6-[4-(2-benzoyl-1,2,3,4-tetrahydroisoquinoline-3-carbonylamino)phenyl]-5-methyl-4,5-dihydro-3 (2H)pyridazinone, and 6-[4-(N-carbobenzoxy-L-asparaginylamino)-phenyl]-5methyl-4,5-dihydro-3(2H)-pyridazinone.

2. A compound selected from the group consisting of 6[4-(N-carbobenzoxy-L-phenylalanylamino)-phenyl]-5-methyl-4,5-dihydro-3(2H)-pyridazinone, 6-[4-(L-phenylalanylamino)-phenyl-]5-methyl-4,5-dihydro-3(2H)-pyridazinone, 6-[4-(N-carbobenzoxy-L-tryptophylamino)-phenyl]-5-methyl-4,5-dihydro-3(2H)-pyridazinone, 6-[4(2-benzoyl-1,2,3,4-tetrahydroisoquinoline-3-carbonylamino)-phenyl]-5-methyl-4,5-dihydro-3 (2H)pyridazinone, and 6-[4-(N-carbobenzoxy-L-asparaginylamino)-phenyl]-5methyl-4,5-dihydro-3(2H)-pyridazinone.

4,965,264

THIENOCINNOLINE COMPOUNDS AND THEIR PHARMACEUTICAL USE

Toru Nakao; Kenji Morita; Masao Hisadome, and Shuzo Takehara, all of Nakatsu, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP88/00290, § 371 Date Nov. 18, 1988, § 102(e) Date Nov. 18, 1988, PCT Pub. No. WO88/07533, PCT Pub. Date Oct. 6, 1988

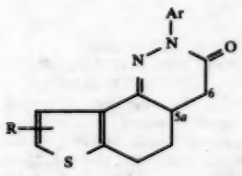
PCT Filed Mar. 17, 1988, Ser. No. 320,267

Claims priority, application Japan, Mar. 25, 1987, 62-70838

Int. Cl.[5] A61K *31/50;* **C07D** *495/04*

U.S. Cl. 514—248 **3 Claims**

1. A thienocinnoline compound of the formula



wherein R is hydrogen, a halogen or a lower alkyl;

Ar is a member selected from the group consisting of phenyl, naphthyl, pyridyl, thienyl, pyrazolyl, imidazolyl, pyrimidinyl, pyridazinyl and benzimidazolyl, which Ar is unsubstituted or substituted by 1 or 2 members selected from the group consisting of halogen, lower alkyl, lower alkoxy, nitro, amino, hydroxy, trifluoromethyl and lower alkanoylamino; and

the bond between the 5a-position and 6-position is a single bond or a double bond.

4,965,265

FUNGICIDAL 4-AZA-1,10-PHENANTHROLINE DERIVATIVES

Ulrich Heinemann; Wilhelm Brandes, both of Leichlingen; Stefan Dutzmann, Duesseldorf, and Gerd Hänssler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

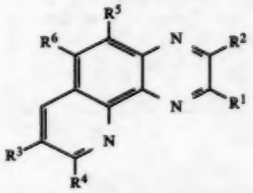
Filed Apr. 12, 1989, Ser. No. 336,925

Claims priority, application Fed. Rep. of Germany, May 7, 1988, 3815617

Int. Cl.[5] C07D *471/04;* **A01N** *43/90, 55/02, 55/04*

U.S. Cl. 514—250 **10 Claims**

1. A 4-aza-1,10-phenanthroline or acid addition product thereof of the formula



(I)

in which

R^1 and R^2 are identical or different and stand for hydrogen; or straight-chain or branched alkyl having 1 to 4 carbon atoms;

R^3 and R^4 are identical or different and stand for hydrogen or straight-chain or branched alkyl having 1 to 4 carbon atoms, and

R^5 and R^6 individually stand for hydrogen or together with the carbon atoms to which they are bonded stand for a benzo group,

with the exception of the compound 4-aza-1, 10-phenanthroline

2. A fungicidal composition comprising a fungicidally effective amount of a compound or addition product thereof according to claim 1 and a diluent.

4,965,266

HETEROARYLCARBOXAMIDE DERIVATIVES, PROCESS FOR PREPARING THE SAME AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Hitoshi Uno, Takatsuki; Tatsuya Kon, Ashiya; Yoshinori Nishikawa, Ikeda; Tokuhiko Shindo, Nara; Hideo Nakamura, Tenri, and Katsumi Ishii, Otsu, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

PCT No. PCT/JP88/00038, § 371 Date Oct. 18, 1988, § 102(e) Date Oct. 18, 1988, PCT Pub. No. WO88/05435, PCT Pub. Date Jul. 28, 1988

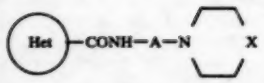
PCT Filed Jan. 20, 1988, Ser. No. 296,083

Claims priority, application Japan, Jan. 20, 1987, 62-11128

Int. Cl.[5] A61K *31/495;* **C07D** *401/14*

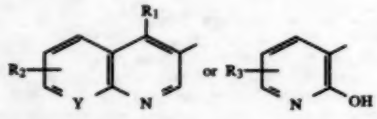
U.S. Cl. 514—253 **16 Claims**

1. A compound of the formula (I):



(I)

wherein A means an alkylene group having 3 to 5 carbon atoms, means $>NCHPh_2$ or $>C{=}CPh_2$ in which Ph means phenyl and Het means a group of the formulas:



in which Y means nitrogen atom or =CH—, R_1 means hydroxy or mercapto, R_2 means hydrogen atom, a halogen atom, hydroxy, an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, nitro or cyano, R_3 means an alkyl group having 1 to 6 carbon atoms, provided that R_2 is attached at the 7-position when Y means nitrogen atom, or a physiologically acceptable salt thereof.

9. A pharmaceutical composition comprising an antiallergic effective amount of a compound as set forth in claim 1 or a physiologically acceptable salt thereof in admixture with a pharmaceutically acceptable carrier or diluent.

4,965,267

PYRANOQUINONES WITH ANTICOCCIDIAL ACTIVITY

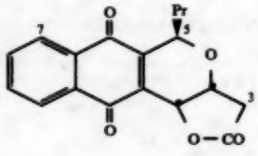
George A. Kraus, and Donald L. Reynolds, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Aug. 21, 1989, Ser. No. 395,992

Int. Cl.[5] **A01N** *43/58;* **C07D** *307/77*

U.S. Cl. 514—253 **5 Claims**

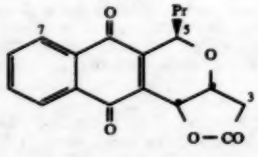
1. A pyranoquinone of the formula:



or a physiologically acceptable salt thereof.

2. A method of treating coccidiosis in fowl, said method comprising:

administering a small but coccidiosis treatment effective amount of



or a physiologically acceptable salt thereof to said fowl.

4,965,268

AMINOMETHYL OXOOXAZOLIDINYL CYCLOALKYLBENZENE DERIVATIVES USEFUL AS ANTIBACTERIAL AGENTS

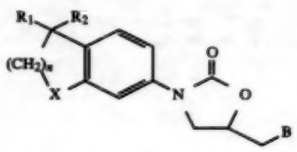
Chia-Lin J. Wang, and Mark A. Wuonola, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 233,828, Aug. 19, 1988, Pat. No. 4,921,869, which is a division of Ser. No. 106,358, Oct. 9, 1987, Pat. No. 4,801,600. This application Mar. 15, 1990, Ser. No. 497,213

Int. Cl.[5] **A61K** *31/495, 31/42;* **C07D** *413/14*

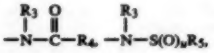
U.S. Cl. 514—253 **18 Claims**

1. A compound having the formula



(I)

wherein for the isomer or racemic mixtures containing it B is NH_2,



or N_3;

u is 1 or 2;

R_3 is H, alkyl of 1–10 carbon atoms, or cycloalkyl of 3–8 carbon atoms;

R_4 is H, alkyl of 1–4 carbon atoms, alkenyl of 2–4 carbon atoms, cycloalkyl of 3–4 carbon atoms, or OR_5;

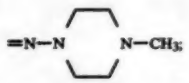
R_5 is alkyl of 1–4 carbon atoms;

X is NR_6;

R_6 is H or alkyl of 1–4 carbon atoms;

n is 1–3; and

R_1 and R_2 taken together are



or a pharmaceutically suitable salt thereof; provided that:

(1) when n is 2, then X is not S; and

(2) when n is 3, then X is not O.

4,965,269

THERAPEUTICALLY ACTIVE CHLORO SUBSTITUTED BENZIMIDAZOLES

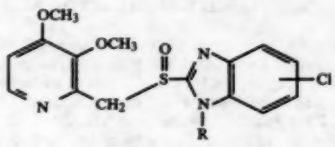
Arne E. Brändström, Göteborg; Per L. Lindberg, Askim; Carl I. Starke, and Gunnel E. Sundén, both of Göteborg, all of Sweden, assignors to AB Hassle, Molndal, Sweden

Filed Dec. 20, 1989, Ser. No. 454,049

Int. Cl.[5] **A61K** *31/495, 31/44;* **C07D** *401/14, 401/12*

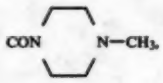
U.S. Cl. 514—253 **15 Claims**

1. Compounds of the formula I



wherein Cl is in 5 or 6 position and whereby R is the group $—CH_2OCOOR^1$, wherein R^1 is a straight or branched alkyl containing 1–6 carbon atoms or benzyl,

or R^1 is the group $—(CH_2)_n$



$—(CH_2)_n$ COOH

or $—(CH_2)_n$ SO_3H wherein n is 1–6 as well as physiologically acceptable salts.

11. 1-Hydroxymethyl-5-chloro-2[[(3,4-dimethoxy-2-pyridinyl)methyl]sulfinyl]-1H-benzimidazole and 1-hydroxymethyl-6-chloro-2[[(3,4-dimethoxy-2-pyridinyl)methyl]sulfinyl]-1H-benzimidazole.

4,965,270

PURINE DERIVATIVES

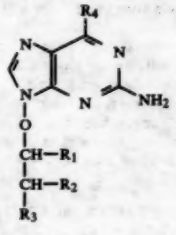
Michael R. Harnden; Paul G. Wyatt, and Stuart Bailey, all of Epsom, England, assignors to Beecham Group p.l.c., Brentford, England

Continuation of Ser. No. 199,382, May 27, 1988, abandoned, which is a continuation-in-part of Ser. No. 944,373, Dec. 11, 1986, abandoned. This application Nov. 7, 1989, Ser. No. 433,011

Int. Cl.[5] C07D *473/18*; A61K *31/52*

U.S. Cl. 514—262 **13 Claims**

1. A compound of formula (I), or a pharmaceutically acceptable salt thereof:



(I)

wherein

R_1 is hydrogen or CH_2OH;

R_2 is hydrogen or, when R_1 is hydrogen, hydroxy or CH_2OH;

R_3 is CH_2OH or, when R_1 and R_2 are both hydrogen, $CH(OH)CH_2OH$;

R_4 is hydrogen, hydroxy, amino or OR_5 wherein

R_5 is C_{1-6} alkyl, phenyl or phenyl C_{1-2} alkyl either of which phenyl moieties may be substituted by one or two halo, C_{1-4} alkyl or C_{1-4} alkoxy groups; and in which any OH groups in R_1, R_2 and R_3 may be in the form of O-acyl, phosphate, cyclic acetal or cyclic carbonate derivatives thereof.

4,965,271

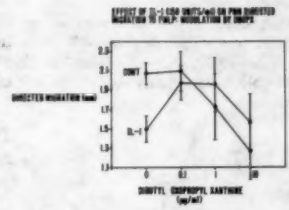
METHOD OF INHIBITING THE ACTIVITY OF LEUKOCYTE DERIVED CYTOKINES

Gerald L. Mandell, Earlysville; Gail W. Sullivan, Charlottesville, both of Va., and William J. Novick, Lebanon, N.J., assignors to Hoechst Roussel Pharmaceuticals, Inc., Somerville, N.J. and University of Virginia, Charlottesville, Va.

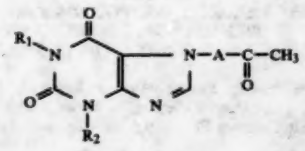
Continuation-in-part of Ser. No. 947,905, Dec. 31, 1986, abandoned. This application Dec. 11, 1987, Ser. No. 131,785

Int. Cl.[5] A61K *31/52*

U.S. Cl. 514—263 **14 Claims**



1. A method of treating a human to inhibit tissue injury accompanying inflammation resulting from leukocyte activity induced by cytokines produced in response to an inflammatory stimulus in the human, wherein the method comprises administering to said human at least one 7(oxoalkyl) 1,3-dialkyl xanthine of the formula



in which

R_1 and R_2 are the same or different and are selected from the group consisting of straight chain or branched chain alkyl radicals with 2 to 6 carbon atoms, cyclohexyl, straight chain or branched chain alkoxyalkyl and hydroxyalkyl radicals; and

A represents a hydrocarbon radical with up to 4 carbon atoms which can be substituted by a methyl group;

wherein said xanthine is administered to said human in an amount sufficient to inhibit activity of human interleukin-1, human tumor necrosis factor, or the activity of other human leukocyte-derived human cytokines on polymorphonuclear leukocytes or monocytes in said human to thereby inhibit said tissue injury.

4,965,272

ANTIMICROBIAL COMPOUND AND COMPOSITIONS PARTICULARLY EFFECTIVE AGAINST CANDIDA ALBICANS

Charles D. Hufford, and Alice M. Clark, both of Rte. 6, Box 306, Oxford, Miss. 38655

Filed Jul. 14, 1988, Ser. No. 218,986

Int. Cl.[5] A61K *31/435*

U.S. Cl. 514—288 **3 Claims**

1. An antimicrobial composition consisting essentially of eupolauridine in a therapeutically-effective concentration and a non-toxic, pharmaceutically-acceptable carrier.

4,965,273

CERTAIN 1-TERTIARY-BUTYL-NAPHTHYRIDONE CARBOXYLIC ACID DERIVATIVES ANTI-BACTERIAL AGENTS

Abraham Weber, Sant-Mande; Daniel Bouzard, Franconville; Munir Essiz, Noisy le Grand; Pierre Di Cesare, Meaux; Jean-Pierre Jacquet, Menestreau-en-Villette, and Philippe Remuzon, Paris, all of France, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 99,231, Sep. 25, 1987, abandoned, which is a continuation-in-part of Ser. No. 916,752, Oct. 8, 1986, abandoned. This application Dec. 1, 1988, Ser. No. 278,638

Int. Cl.[5] A61K *31/435;* C07D *471/04*

U.S. Cl. 514—300 7 Claims

1. A compound selected from the group consisting of 7-(1R,4R-2,5-diazabicyclo[2.2.1]heptan-2-yl)-1-(1,1-dimethylethyl)-1,4-dihydro-6-fluoro-4-oxo-1,8-naphthyridine-3-carboxylic acid and the pharmaceutically acceptable acid addition and base salts thereof.

4,965,274

QUINOLYL METHOXY COMPOUNDS, PROCESSES FOR PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

Teruo Oku; Yoshio Kawai; Hiroshi Kayakiri; Kazuyoshi Kuratani, and Masashi Hashimoto, all of Tsukuba, Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

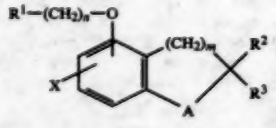
Continuation-in-part of Ser. No. 181,174, Apr. 13, 1988, Pat. No. 4,923,881. This application Mar. 27, 1989, Ser. No. 329,317

Claims priority, application United Kingdom, Apr. 28, 1987, 8710008; Aug. 21, 1987, 8719778; Jan. 15, 1988, 8800872

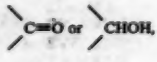
Int. Cl.[5] A61K *31/47;* C07D *215/02, 215/14*

U.S. Cl. 514—311 2 Claims

1. A method of treating arteriosclerosis in a subject in need thereof, which comprises administering to the subject an effective amount of a compound of the formula:



wherein A is



R^1 is quinolyl,

R^2 is hydrogen or lower alkyl,

R^3 is lower alkyl,

X is hydrogen, halogen, hydroxy or lower alkyl,

m is an integer 1 or 2, and

n is an integer 1 to 4, or pharmaceutically acceptable salts thereof.

4,965,275

PESTICIDAL PYRIDINE-4-CARBOXYLIC ACID ANILIDES

Detlef Wollweber, Wuppertal; Wolfgang Krämer, Burscheid; Stefan Dutzmann, Duesseldorf, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

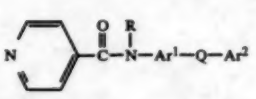
Filed Feb. 24, 1989, Ser. No. 316,056

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1988, 3806489

Int. Cl.[5] C07D *213/81;* A01N *43/40*

U.S. Cl. 514—354 8 Claims

1. A pyridine-4-carboxylic acid anilide of the formula



(I)

in which

R stands for hydrogen or for straight-chain or branched alkyl having 1 to 4 carbon atoms,

Q stands for a radical of the formula

or

R^1 stands for hydrogen or for straight-chain or branched alkyl having 1 to 4 carbon atoms,

Ar^1 stands for an o-phenylene radical which is optionally monosubstituted or disubstituted by identical or different substituents and

Ar^2 stands for phenyl which is optionally monosubstituted or disubstituted by identical or different substituents, when present the phenyl or phenylene substituents for the radicals Ar^1 or Ar^2 in each case being selected from the group consisting of halogen, in each case straight-chain or branched alkyl, alkoxy or alkylthio each having 1 to 4 carbon atoms, and in each case straight-chain or branched halogenoalkyl, halogenoalkoxy or halogenoalkylthio each having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms,

with the proviso that at least one of the radicals Ar^1 or Ar^2 is substituted by halogenoalkoxy or halogenoalkylthio, or an acid addition salt or metal salt complex thereof.

7. A method of combating fungi which comprises applying to such fungi or to a fungus habitat a fungicidally effective amount of a compound, salt or complex according to claim 1.

4,965,276

MEDICAMENTS TO COMBAT CHRONIC GRAFT-VERSUS-HOST DISEASES

Robert R. Bartlett, Darmstadt; Rudolf Schleyerbach, Hofheim am Taunus, and Friedrich-Johannes Kämmerer, Hochheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

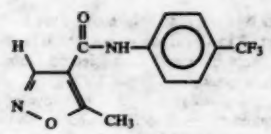
Filed Sep. 25, 1986, Ser. No. 911,328

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1985, 3534440

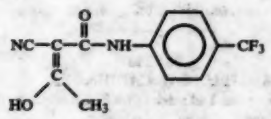
Int. Cl.[5] A61K *31/42, 31/275*

U.S. Cl. 514—378 10 Claims

1. A method of treating chronic graft-versus-host diseases which comprises administering to a recipient an effective amount of a pharmaceutical composition containing as an active ingredient at least one compound of the formulae 1 or 2



1



2

the latter being present per se or in the form of a physiologically tolerable salt.

4,965,277

ALLYLAMINOETHYLAZOLES

Karl Schermanz, Graz; Gerald Saischek, Lannach; Dietmar Kores, Leonding; Josef Graf, Kleinraming; Gerhard Haas, Niederthalheim, and Kurt Martetschläger, Linz, all of Austria, assignors to CL Pharma Aktiengesellschaft, Linz, Austria

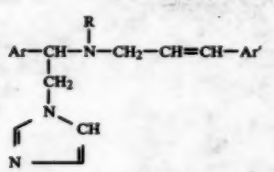
Filed Jul. 12, 1989, Ser. No. 378,898

Claims priority, application Austria, Jul. 22, 1988, 1875/88

Int. Cl.[5] A01N *43/50*; C07D *233/00, 403/00, 233/54*

U.S. Cl. 514—385 **8 Claims**

1. An allylaminoethylimidazole of the formula:



I

in which R is a hydrogen atom or an alkyl group containing 1 to 5 carbon atoms; each of Ar and Ar' is an unsubstituted phenyl group, a phenyl group substituted by one or more substituents selected from C_1–C_3 alkyl, C_1–C_3 alkoxy, nitro and halogen, an unsubstituted thienyl group, or a thienyl group substituted by halogen or naphthyl; or a phytophysiologically or pharmacologically tolerated acid addition salt thereof.

7. A method of combating pathogenic fungi which comprises administering a fungicidally-effective amount of at least one compound of formula I according to claim 1 to said fungi or their environment.

4,965,278

7-(SUBSTITUTED)AMINO)-8-((SUBSTITUTED)CARBONYL)-METHYLAMINO)-1-OXASPIRO[4,5]DECANES AS DIURETICS ANTIIFLAMMATORY, AND CEREBROVASCULAR AGENTS

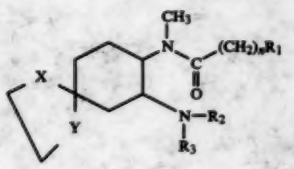
David C. Horwell, and David C. Rees, both of Cambridge, England, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 21, 1989, Ser. No. 341,336

Int. Cl.[5] A61K *31/40*

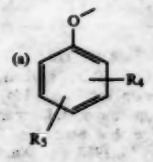
U.S. Cl. 514—414 **3 Claims**

1. A method for treating stroke which comprises administering to a patient in need of said treatment a therapeutically effective amount of a compound in unit dosage form of formula



I

or a pharmaceutically acceptable salt thereof wherein n is an integer of from one to six; either of X or Y is oxygen and the other is —CH_2—; R_1 is selected from



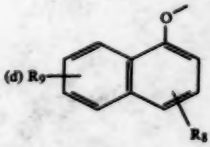
(a)

where R_4 and R_5 are independently hydrogen, fluorine, chlorine, bromine, nitro, trifluoromethyl, alkyl of from one to six carbon atoms, alkoxy of from one to six carbon atoms, or aryl;

(b) 3,4,5-trimethylphenoxy;

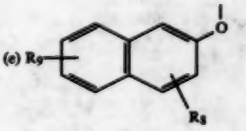
(c) R_6

where R_6 is hydrogen, fluorine, chlorine, alkyl of from one to six carbon atoms, or aryl; Z is —CH_2—, —O—, —S—, or —NR_7— where R_7 is hydrogen, alkanoyl of from one to six carbon atoms, or alkyl of from one to six carbon atoms;



(d) R_9

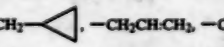
wherein R_8 and R_9 are independently hydrogen, fluorine, bromine, alkyl of from one to six carbon atoms, or alkoxy of from one to four carbon atoms; or



(e) R_9

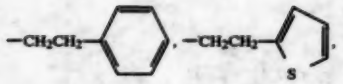
where R_8 and R_9 are as defined above;

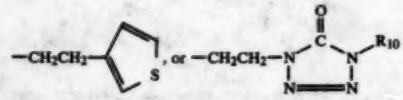
where R_2 is methyl and R_3 is hydrogen, alkyl of from one to six carbon atoms,



—CH_2—, —$CH_2CH{=}CH_2$, —$CH_2C{\equiv}CH$,

-continued





where R_{10} is alkyl of from one to four carbon atoms; or where R_2 and R_3 when taken together with the nitrogen atom to which they are attached, form a pyrrolidinyl, piperidinyl, or hexahydro-1H-azepinyl ring.

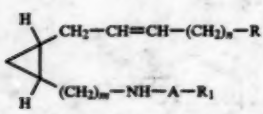
4,965,279

CYCLOPROPYL AZA PROSTAGLANDIN ANALOGS

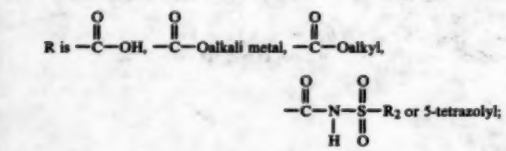
Raj N. Misra, Hopewell; David M. Floyd, Pennington, and Steven E. Hall, Ewing Township, Mercer County, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

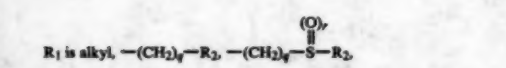
Filed Nov. 18, 1988, Ser. No. 272,953
Int. Cl.[5] A61K *31/41*; C07C *69/74*
U.S. Cl. 514—381 13 Claims

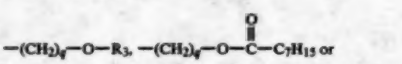
1. A compound of the formula

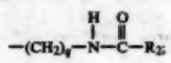


including pharmaceutically acceptable salts thereof, wherein

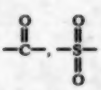








R_2 is aryl, alkyl or cycloalkyl;
R_3 is aryl, alkyl or cycloalkyl;
A is



or a single bond;
m is an integer from 1 to 2;
n is an integer from 2 to 4;
q is an integer from 1 to 4, except when A = single bond then q is an integer from 2–4; and
r is zero or an integer from 1 to 2;
wherein the $(CH_2)_m$ and $(CH_2)_n$ groups may be substituted with one or two alkyl and/or one or two alkoxy substituents;
the term cycloalkyl refers to saturated cyclic hydrocarbon groups having 3 to 12 carbon atoms which may include 1 or 2 substituents independently selected from halogen, alkyl and alkoxy; and,
the term aryl refers to monocyclic or bicyclic aromatic groups containing from 6 to 10 carbon atoms in the ring portion which may include 1 or 2 substituents independently selected from alkyl, halogen and alkoxy.

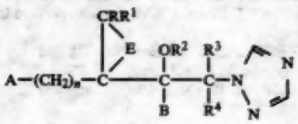
4,965,280

ANTIFUNGAL CARBINOLS

John Cuomo, Newark, Del.; Richard S. Greenberg, Fairlawn, N.J., and Richard E. Olson, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

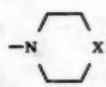
Division of Ser. No. 134,261, Dec. 17, 1987, which is a continuation-in-part of Ser. No. 42,541, Apr. 29, 1987, abandoned, which is a continuation-in-part of Ser. No. 877,525, Jun. 23, 1986, abandoned. This application Oct. 18, 1989, Ser. No. 423,250
Int. Cl.[5] A01N *43/653*; A61K *31/41*; C07D *249/08*
U.S. Cl. 514—383 27 Claims

1. A compound having the formula:



(I)

or a pharmaceutically or agriculturally suitable salt thereof wherein
E is a bond;
A is

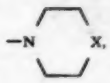


optionally substituted with 1 or 2 methyl groups, or a heterocycle selected from imidazol-1-yl, 1,2,4-triazol-1-yl, 2- or 3-thienyl, and 2-, 3-, or 4-pyridyl or an N-oxide thereof optionally substituted with one or two substituents each of which is independently selected from:
halogen, alkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms, haloalkoxy of 1–4 carbon atoms, CF_3, and $S(O)_mR^5$;
B is alkyl of 1–8 carbon atoms, naphthyl, biphenyl,

perfluoroalkyl of 1–8 carbon atoms, phenyl optionally substituted with 1–3 substituents each of which is independently selected from:
halogen, alkyl of 1–4 carbon atoms, haloalkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms, and with no more than one group selected from haloalkoxy of 1–4 carbon atoms, CN, CO_2R^{14}, $CH{=}NOR^{14}$, $S(O)_mR^5$, 2-, 3-, 4-pyridyl or an N oxide thereof,
benzyl optionally substituted on the phenyl ring with halogen or alkyl of 1–4 carbon atoms, or optionally α-substituted with 1 or 2 methyl groups, or
a heterocycle selected from 2- or 3-thienyl, and 2-, 3-, or 4-pyridyl optionally substituted with one or two substituents each of which is independently selected from:

halogen, alkyl of 1–4 carbon atoms, haloalkoxy of 1–4 carbon atoms, CF_3 or $S(O)_mR^5$;

n is 0–4 with the proviso that when A is



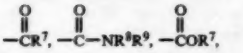
then n is other than O;

m each occurrence is 0, 1 or 2;

X is C, NR^{10}, or O;

R and R^1 independently are H, alkyl of 1–4 carbon atoms, halogen or phenyl, or taken together form cycloalkyl of 3–7 carbon atoms;

R^2 is H, allyl, propargyl, alkyl of 1–4 carbon atoms,



or haloalkyl of 1–4 carbon atoms;

R^3 and R^4 independently are H, F, or alkyl of 1–4 carbon atoms;

R^5 is alkyl of 1–4 carbon atoms;

R^6 is phenyl optionally substituted with a total of 1–3 substituents each of which is independently selected from halogen and CF_3;

R^7 is alkyl of 1–4 carbon atoms, phenyl, or benzyl;

R^8 and R^9 independently are H, alkyl of 1–4 carbon atoms, phenyl or benzyl;

R^{10} is H, alkyl of 1–4 carbon atoms, or acetyl; and

R^{14} is alkyl of 1–4 carbon atoms.

13. A pharmaceutical composition comprising a suitable pharmaceutical carrier and a therapeutically effective amount of a compound of claim **1**.

4,965,281

ANTIFUNGAL CARBINOLS

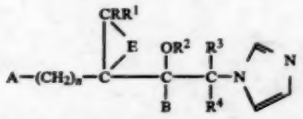
John Cuomo, Newark, Del.; Richard S. Greenberg, Fairlawn, N.J., and Richard E. Olson, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Cmopany, Wilmington, Del.

Division of Ser. No. 134,261, Dec. 17, 1987, which is a continuation-in-part of Ser. No. 42,541, Apr. 29, 1987, abandoned, which is a continuation-in-part of Ser. No. 877,525, Jun. 23, 1986, abandoned. This application Oct. 18, 1989, Ser. No. 423,256

Int. Cl.[5] **A01N** *43/50*; **A61K** *31/415*; **C07D** *233/60*

U.S. Cl. 514—399 **27 Claims**

1. A compound having the formula:

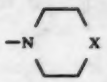


(I)

or a pharmaceutically or agriculturally suitable salt thereof wherein

E is a bond;

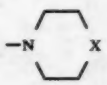
A is perfluoroalkyl of 1–8 carbon atoms, $N(CH_3)_2$, OH, naphthyl optionally substituted with a total of 1–3 substituents each of which is independently selected from halogen and CF_3,



optionally substituted with 1 or 2 methyl groups, phenyl optionally substituted with a total of 1–3 substituents each of which is independently selected from:

halogen, alkyl of 1–4 carbon atoms, haloalkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms, and with no more than one group selected from:

haloalkoxy of 1–4 carbon atoms, CN, CO_2R^{14}, $CH{=}NOR^{14}$, $S(O)_mR^5$, R^6, 2-, 3-, or 4-pyridyl or an N-oxide thereof, imidazol-1-yl, 1,2,4-triazol-1-yl, and



optionally substituted with 1 or 2 methyl groups,

or a heterocycle selected from imidazol-1-yl, 1,2,4-triazol-1-yl, 2- or 3-thienyl, and 2-, 3-, or 4-pyridyl or an N-oxide thereof optionally substituted with one or two substituents each of which is independently selected from:

halogen, alkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms, haloalkoxy of 1–4 carbon atoms, CF_3, and $S(O)_mR^5$;

B is alkyl of 1–8 carbon atoms, naphthyl, biphenyl,

perfluoroalkyl of 1–8 carbon atoms,

phenyl optionally substituted with 1–3 substituents each of which is independently selected from:

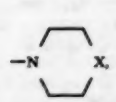
halogen, alkyl of 1–4 carbon atoms, haloalkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms, and with no more than one group selected from haloalkoxy of 1–4 carbon atoms, CN, CO_2R^{14}, $CH{=}NOR^{14}$, $S(O)_mR^5$, 2-, 3-, 4-pyridyl or an N oxide thereof,

benzyl optionally substituted on the phenyl ring with halogen or alkyl of 1–4 carbon atoms, or optionally α-substituted with 1 or 2 methyl groups, or

a heterocycle selected from 2- or 3-thienyl, and 2-, 3-, or 4-pyridyl optionally substituted with one or two substituents each of which is independently selected from:

halogen, alkyl of 1–4 carbon atoms, haloalkoxy of 1–4 carbon atoms, CF_3 or $S(O)_mR^5$;

n is 0–4 with the proviso that when A is



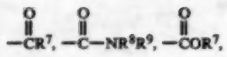
$N(CH_3)_2$, or OH, then n is other than 0;

m each occurrence is 0, 1 or 2;

X is C, NR^{10}, or O;

R and R^1 independently are H, alkyl of 1–4 carbon atoms, halogen or phenyl, or taken together form cycloalkyl of 3–7 carbon atoms;

R^2 is H, allyl, propargyl, alkyl of 1–4 carbon atoms,



or haloalkyl of 1–4 carbon atoms;

R^3 and R^4 independently are H, F, or alkyl of 1–4 carbon atoms;

R^5 is alkyl of 1–4 carbon atoms;

R^6 is phenyl optionally substituted with a total of 1–3 substituents each of which is independently selected from halogen and CF_3;

R^7 is alkyl of 1–4 carbon atoms, phenyl, or benzyl;

R^8 and R^9 independently are H, alkyl of 1–4 carbon atoms, phenyl or benzyl;

R^{10} is H, alkyl of 1–4 carbon atoms, or acetyl; and

R^{14} is alkyl of 1–4 carbon atoms.

14. A pharmaceutical composition comprising a suitable pharmaceutical carrier and a therapeutically effective amount of a compound of claim **1**.

4,965,282

BENZODIOXOLE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS AND USE

Norio Takamura, Asaka; Isao Inoue, Toda; Masaru Inage, Kitamoto; Isao Yamaguchi, Tokyo, and Koji Yano, Hoya, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

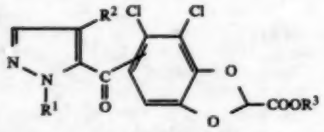
Division of Ser. No. 304,252, Jan. 31, 1989. This application Mar. 30, 1990, Ser. No. 501,898

Claims priority, application Japan, Feb. 16, 1988, 63-33693

Int. Cl.[5] A61K *31/415, 31/44;* **C07D** *405/04, 405/10*

U.S. Cl. 514—406 **8 Claims**

1. A benzodioxole derivative of the formula:



(I)

wherein R^1 is a lower alkoxy-alkyl group, R^2 is a hydrogen atom or a halogen atom and R^3 is a hydrogen atom or a lower alkyl group, or a salt thereof.

7. A pharmaceutical composition which comprises a therapeutically effective amount of the compound claimed in claim **1** and pharmaceutically acceptable carrier therefor.

4,965,283

AMINO ACID ESTERS, PROCESS FOR THE PREPARATION THEREOF AND USE THEREOF

Klaus Klessing, Ettlingen, and Shyam S. Chatterjee, Karlsruhe, both of Fed. Rep. of Germany, assignors to Dr. Willmar Schwabe GmbH & Co., Karlsruhe, Fed. Rep. of Germany

PCT No. PCT/DE88/00684, § 371 Date Jun. 8, 1989, § 102(e) Date Jun. 8, 1989, PCT Pub. No. WO89/04310, PCT Pub. Date May 18, 1989

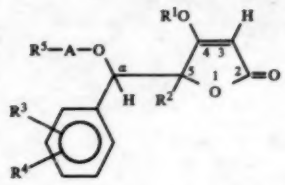
PCT Filed Nov. 4, 1988, Ser. No. 372,640

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1987, 3737399

Int. Cl.[5] C07D *307/60, 405/12;* **A61K** *31/40, 31/365*

U.S. Cl. 514—422 **8 Claims**

1. Amino acid esters of the formula I



(I)

wherein the oxygen atoms at C-5 and C-α assume relative to each other the threo position and wherein

R^1 is a methyl or ethyl group,

R^2 is a hydrogen atom or a methyl group,

R^3 and R^4 are independently from each other a hydrogen, fluorine, chlorine or bromine atom, a lower alkyl group having 1 to 3 C atoms, a perfluoro lower alkyl having 1 to 3 C atoms, the difluoromethoxy or nitro group,

A is the acyl radical of one of the following amino acids: alanine, leucine, isoleucine, norleucine, valine, norvaline, phenylglycine, phenylalanine, proline, 5-oxoproline, glutamic acid, glutamine, asparaginic acid, asparagine, methionine, glycine, β-alanine, 4-aminobutyric acid, 2-methylalanine or a 1-amino-1-cycloalkane carboxylic acid having a 3-7-member cycloalkyl radical,

in each case a hydrogen atom or the amino group of said amino acids being replaced by the radical R^5, and

R^5 is a hydrogen atom, a lower alkanoyl radical having 2 to 5 C atoms, the benzyloxycarbonyl radical (Z) or the tert. butoxycarbonyl radical (BOC),

and pharmacologically compatible (acceptable) acid addition salts thereof.

8. Pharmaceutical preparation comprising a pharmacological acceptable carrier and one or more of the compounds according to any one of the claims 1 to 7.

4,965,284

SUBSTITUTED DIBENZOTHIOPHENES

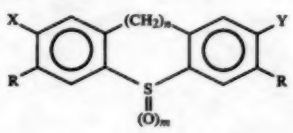
Vijay G. Nair, Nanuet; Ramson B. Conrow, Pearl River; Bosco S. Wang, Cranbury, and V. M. Ruszala-Mallon, New City, all of N.Y., assignors to American Cyanamid Company, Wayne, N.J.

Continuation-in-part of Ser. No. 196,166, May 19, 1988, abandoned. This application Apr. 25, 1989, Ser. No. 341,862

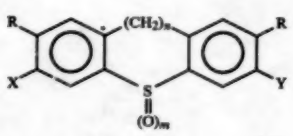
Int. Cl.[5] C07D *409/12*

U.S. Cl. 514—443 **23 Claims**

1. A compound selected from the group consisting of those of the formulae:



(II)



(III)

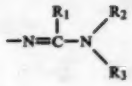
wherein

X is hydrogen, fluoro, chloro or bromo; Y is hydrogen, fluoro, chloro or bromo;

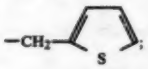
n is 0;

m is 1 or 2;

R is a moiety of the formula;



R_1 is alkyl or branched alkyl(C_1–C_6), cycloalkyl (C_3–C_6), phenyl, methylphenyl, thiophene or



R_2 is hydrogen, alkyl or branched alkyl (C_1–C_6) or benzyl;
R_3 is alkyl or branched alkyl (C_1–C_6) or cycloalkyl (C_3–C_6) with the proviso that when X and Y are hydrogen and R_1 is phenyl or methylpehenyl, R_2 and R_3 cannot be hydrogen; and the pharmacologically acceptable acid-addition salts thereof.

4,965,285

DIBENZOTHIPHENE AND NAPHTHALENETHIOPHENE DERIVATIVES

Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 132,724, Dec. 11, 1987, Pat. No. 4,866,070, which is a continuation of Ser. No. 801,085, Nov. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 673,355, Nov. 20, 1984, abandoned. This application Aug. 25, 1989, Ser. No. 399,713

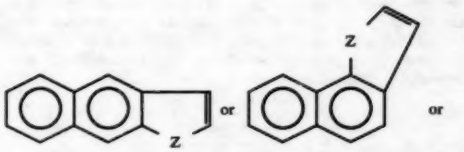
Int. Cl.[5] C07D *333/76, 333/74;* A61K *31/38*

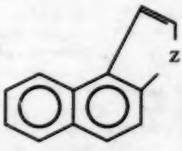
U.S. Cl. 514—443 **14 Claims**

1. A compound of the formula (I):

$$ArCH_2R^1 \qquad (I)$$

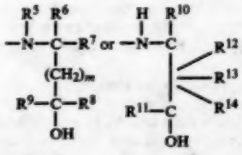
or a pharmaceutically acceptable acid addition salt thereof wherein Ar is





wherein Z is S

wherein R^1 contains not more than eight carbon atoms and is a group:



wherein m is o or 1:

R^5 is hydrogen;

R^6 and R^7 are the same or different and each is hydrogen or C_{1-5} alkyl, or C_{1-5} alkyl substituted by hydroxy;

R^8 and R^9 are the same or different and each is hydrogen or C_{1-3} alkyl;

is a five- or six-membered saturated carbocyclic ring; R^{10} is hydrogen, methyl or hydroxymethyl;

R^{11}, R^{12}, R^{13} and R^{14} are the same or different and each is hydrogen or methyl;

4,965,286

AGENTS FOR REPELLING INSECTS AND MITES

Bernd W. Krüger; Klaus Sasse, both of Gladbach; Winfried Lunkenheimer, Bayerwerk; Franz P. Hoever, Bayerwerk; Günther Nentwig, Bayerwerk, and Wolfgang Behrenz, Overath, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

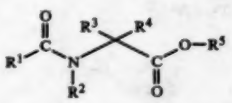
Filed May 24, 1989, Ser. No. 356,480

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1988, 3820528

Int. Cl.[5] A01N *47/40, 47/46, 47/48*

U.S. Cl. 514—514 **6 Claims**

1. An insect and mite repellent composition comprising a repellent effective amount of at least one acylated α-amino acid ester derivative of the formula



in which

R^1 is hydrogen or for an unsubstituted or substituted alkyl, alkenyl or alkinyl radical,

R^2 and R^5 are identical or different and are an unsubstituted or substituted alkyl, alkenyl or alkinyl radicals and

R^3 and R^4 are hydrogen or an unsubstituted or substituted alkyl, aralkyl or aryl, or R^3 and R^4 together with the atom to which they are bonded form an unsubstituted or substituted, monocyclic ring in combination with a suitable extender.

4,965,287

METHOD FOR CONTROLLING PARASITOSIS IN BEES

Wilhelm Stendel, Wuppertal; Hubert Neuhauser, Bergisch-Gladbach, and Nikolaus Koeniger, Oberursel, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 922,636, Oct. 24, 1986, abandoned. This application Mar. 2, 1989, Ser. No. 318,041

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1985, 3538688

Int. Cl.[5] A61K *31/215*

U.S. Cl. 514—531 **12 Claims**

1. In the control of parasitosis in honey bees by applying to the bees, their food or their habitat a parasiticide which is selectively active against such parasitosis but not against said bees, the improvement wherein such parasiticide is a synthetic pyrethroid.

4,965,288

INHIBITORS OF LYSYL OXIDASE

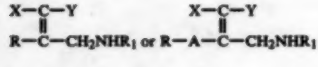
Michael G. Palfreyman, Cincinnati; Philippe Bey, Cincinnati, and Ian A. McDonald, Loveland, all of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 160,364, Feb. 25, 1988, abandoned. This application Sep. 19, 1989, Ser. No. 409,270

Int. Cl.[5] A61K *31/135, 31/15*

U.S. Cl. 514—649 7 Claims

1. A method of treating diseases and conditions associated with the abnormal deposition of collagen in a patient in need thereof which comprises administering to the patient a lysyl oxidase inhibiting amount of penicillamine together with an effective amount of a compound of the formula

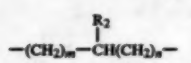


wherein

X and Y are identical and are each either a fluoro, chloro, or bromo group or one of X and Y is a hydrogen and the other is a fluoro, chloro, or bromo group;

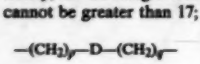
R_1 is a hydrogen or a (C_1–C_4)alkyl group;

A is a divalent radical group selected from



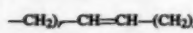
wherein

R_2 is hydrogen, methyl, or ethyl, and m and n, independently, are an integer from 0 to 16, provided that m+n cannot be greater than 17;



wherein

D is oxygen or sulfur, p is an integer of from 0 to 16, and q is an integer of from 1 to 16, provided that m+n cannot be greater than 17; and



wherein

s is an integer of from 1 to 16 and r is an integer of from 0 to 16, provided that r+s cannot be greater than 16; and

R is a methyl group, a phenyl, or a phenyl substituted with one or two members of the group (C_1–C_5)alkyl, (C_1–C_5)alkoxy, hydroxy, chloro, bromo, fluoro, iodo, trifluoromethyl, nitro, (C_1–C_5)alkylcarbonyl, benzoyl, or phenyl; or a pharmaceutically acceptable salt thereof.

4,965,289

SUBSTRATE AND PROCESS FOR MAKING A SUBSTRATE

David C. Sherrington, Kirkintilloch, Scotland, and Philip W. Small, Merseyside, United Kingdom, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Filed Apr. 25, 1988, Ser. No. 185,672

Claims priority, application United Kingdom, Apr. 24, 1987, 8709689; Nov. 24, 1987, 8727474

Int. Cl.[5] C08J *9/36*

U.S. Cl. 521—53 14 Claims

1. A substrate comprising a porous cross-linked vinyl polymeric material having a pore structure providing an open porosity of at least 75% and comprising cells having a diameter in the range 1 to 100 μm interconnected by holes and a gel contained and retained in said pore structure by chemical binding to the surfaces of the said polymeric material, said gel being polymeric and having reactive functionality, said cells and holes of said polymeric material having a shape and conformation resulting from polymerization of vinyl material in a high internal phase emulsion system.

4,965,290

LOW PERMITTIVITY COMPOSITE MATERIAL

Takeshi Hoshiko, Koganei, Japan, assignor to Junkosha Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1989, Ser. No. 314,051

Claims priority, application Japan, Mar. 4, 1988, 63-52243

Int. Cl.[5] C08J *9/32*

U.S. Cl. 521—54 13 Claims

1. A composite material having low permittivity comprising hollow bubbles formed of a thermo-fusible fluoro-resin selected from the group consisting of ethylene-tetra-fluoride-propylene-hexafluoride copolymer resin, ethylene-ethylene-tetrafluoride copolymer resin, ethylene-ethylene-chloride-trifluoride copolymer resin, and mixtures thereof; a polymer material surrounding and supporting the thermo-fusible fluoro-resin forming the hollow bubbles.

4,965,291

METHOD OF MANUFACTURING POROUS MEMBRANE AND POROUS MEMBRANE MANUFACTURED BY THE SAME METHOD

Hideaki Kitoh; Yukio Seita; Noriyuki Koyama, all of Fuji, and Shinsuke Yokomachi, Fujinomiya, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1989, Ser. No. 331,342

Claims priority, application Japan, Apr. 1, 1988, 63-80453

Int. Cl.[5] C08J *9/28*

U.S. Cl. 521—64 6 Claims

1. A method of manufacturing a porous membrane comprising:

(a) dissolving a vinylidene fluoride polymer in a good solvent and

(b) causing solidification of the resultant solution in a non-solvent,

wherein step (a) is carried out in a predetermined pressure condition at a pressure of at least 0.1 kg/cm^2 above normal pressure and wherein the good solvent is a solvent which provides a non-solvent property at normal temperature but is capable of providing its intrinsic good-solvent property when heated to or above the temperature which is about 20° C. lower than the boiling point of the solvent, or a mixture of said solvent and a different solvent.

4,965,292

PROCESS FOR STRENGTHENING GEOLOGICAL FORMATIONS

Hanns P. Müller; Manfred Kappe, both of Bergisch-Gladbach; Peter Vehlewald, Leichlingen; Frank Meyer, Essen; Wolfgang Cornely, Gladbeck, and Hans E. Mebesch, Essen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen and Bergwerksverband GmbH, Essen, both of, Fed. Rep. of Germany

Continuation of Ser. No. 231,101, Aug. 11, 1988, abandoned. This application Nov. 17, 1989, Ser. No. 438,903

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1987, 3727880

Int. Cl.[5] C08G *18/08;* C04B *16/08*

U.S. Cl. 521—110 6 Claims

1. A process for strengthening geological formations in underground mines or underground constructions which comprises introducing into the formations to be strengthened, a reaction mixture which reacts to form polyurethane plastics and comprises

(a) a polyisocyanate component,

(b) a polyol component and

(c) about 0.01 to 5% by weight, based on the total weight of components (a) and (b), of a cyclic polydimethylsiloxane having a molecular weight of about 222 to 740.

4,965,293

POLYUREA ELASTOMERS WITH IMPROVED SURFACE QUALITY

Sanns, Jr. Frank, Pittsburgh, Pa., assignor to Mobay Corporation, Pittsburgh, Pa.

Filed Jun. 8, 1989, Ser. No. 362,917

Int. Cl.[5] C08G 18/14

U.S. Cl. 521—124 38 Claims

1. A process for the production of an optionally cellular, polyurea elastomer molding which comprises reacting a reaction mixture containing

(I) a polyisocyanate,

(II) a polyether having at least two isocyanate-reactive groups and a molecular weight of 1800 to 12,000 in which at least 50% of the isocyanate-reactive groups are primary and/or secondary amino groups,

(III) about 5 to 50% by weight, based on the weight of component (II), of a chain extender comprising a sterically hindered aromatic diamine and

(IV) about 0.5 to 10% by weight, based on the weight of components (II) and (III), of a zinc carboxylate containing 8 to 24 carbon atoms per carboxylate group and

(V) about 0.5 to 10% by weight, based on the weight of components (II) and (III), of an active hydrogen containing fatty acid ester having a molecular weight of about 500 to 5000 and prepared by reacting an alcohol with an aliphatic, saturated or unsaturated fatty acid, said ester being characterized in that at least one aliphatic acid which contains more than eight carbon atoms is built into the molecule, said ester further characterized as having an acid number of 0 to 100 and a hydroxyl number of 0 to 150 with at least one of said numbers being greater than 0,

wherein said zinc carboxylate and said fatty acid ester may each be initially blended with either component (II), component (III) or a mixture thereof and the reaction mixture is processed as a one-shot system by the RIM process at an isocyanate index of about 70 to 130.

4,965,294

PHOTOINITIATOR DISPERSIONS

Jörg Ohngemach, Reinheim, and Heiko Zeh, Weiterstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed May 5, 1989, Ser. No. 347,633

Claims priority, application Fed. Rep. of Germany, May 7, 1988, 3815622

Int. Cl.[5] C08K 5/06, 5/07

U.S. Cl. 522—79 9 Claims

1. An aqueous photoinitiator dispersion useful for incorporation into aqueous dispersions of a radiation-curable binder system, comprising 10 to 50% by weight, based on the total amount, of at least one photoinitiator, and 5 to 50% by weight, based on the content of photoinitiator, of at least one non-ionic surfactant having an HLB value of 8 and 18.

9. In an aqueous radiation-curable binder system comprising a binder and an aqueous photoinitiator dispersion, the improvement wherein the aqueous photoinitiator dispersion is one of claim 1.

4,965,295

DIMENSIONALLY STABLE IMPRESSION COMPOSITIONS

Peter Schwabe; Ottfried Schlak; Gottfried Knispel, and Reiner Voigt, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 94,962, Sep. 19, 1987, abandoned, which is a continuation of Ser. No. 713,058, Mar. 18, 1985, abandoned. This application Apr. 12, 1989, Ser. No. 338,358

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1984, 3410646

Int. Cl.[5] A61K 6/10

U.S. Cl. 523—109 7 Claims

1. A dimentionally stable silicone impression and duplicating composition which undergoes crosslinking at ambient temperature by an addition reaction, comprising

(a) a vinyl dimethylsiloxy end blocked dimethylpolysiloxane, which contains vinyl groups on at least two silicon atoms and having a viscosity of 500 to 200,000 mPa.s measured to 20° C.,

(b) an organopolysiloxane possessing two or more Si-H groups in the molecule,

(c) a catalyst, and

(d) a filler,

wherein components (a) and (b) or (a), (b) and a organopolysiloxane without reactive groups contain not more than about 1.5% by weight of volatile oligomers, wherein the 1.5% weight % of volatile oligomers is adjusted to by thorough heating, whereby to result in dimensional stability of the impression, wherein said composition undergoes a linear shrinkage of 0.20% or less after 24 hours at 23° C. according to ADA Specification No. 19.

4,965,296

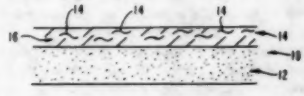
INTUMESCENT FIRE-RETARDANT AND ELECTRICALLY-CONDUCTIVE COATING MATERIAL

Otis H. Hastings, Mahwah, N.J., assignor to No Fire Engineering, Inc., Upper Saddle River, N.J.

Continuation-in-part of Ser. No. 323,806, Mar. 15, 1989, Pat. No. 4,879,320. This application Nov. 6, 1989, Ser. No. 431,755

Int. Cl.[5] C08K 21/14

U.S. Cl. 523—179 30 Claims



1. A fire-retardant and electrically-conductive coating material, comprising:

(a) a fluid intumescent base material having a foaming agent, a blowing agent, a charring agent, a film-forming binder, and a solvent;

(b) an electrically-conductive material dispersed in said intumescent material in the range of 1% to 95% by weight;

(c) said electrically-conductive material consisting of a substrate selected from the group consisting of fibers, spheres, granules, flakes, strands, and combinations thereof, and a coating consisting of an electrically-conductive metal;

(d) said electrically-conductive material including conductive particles with a bulk length of at least 1/32"; and

(e) said fire-retardant and electrically-conductive coating material for coating housing and building frames, industrial and commercial structures, transportation vehicles, and the like to render same fire resistant and electrically conductive.

4,965,297

RESIN COMPOSITION AND METHOD FOR ITS PREPARATION

Fumiyasu Funami, Yokohama; Akira Kitsunezuka, Koga; Shigeharu Arai, Saitama; Nobuhiro Sakuma, Ibaraki; Atsuo Okawara, Sagamihara, and Tomiya Sugiura, Yokohama, all of Japan, assignors to Asahi Fiber Glass Company Limited, Tokyo, Japan

Continuation of Ser. No. 337,853, Apr. 14, 1989, abandoned. This application Oct. 25, 1989, Ser. No. 427,954

Claims priority, application Japan, May 31, 1988, 63-131457; Jun. 10, 1988, 63-141577; Jun. 14, 1988, 63-144826

Int. Cl.[5] C08K 9/02

U.S. Cl. 523—217 5 Claims

1. A method for preparing a resin composition, which comprises:

uniformly mixing glass fiber strands having hypophosphorous acid or its salt attached to the surface thereof, in a melt of a polyphenylene sulfide resin.

5. The method of claim 1, wherein the salt of hypophosphorous acid is calcium or sodium hypophosphite.

4,965,298

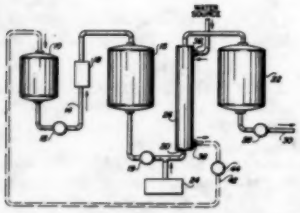
PREPARATION AND COOLING OF AQUEOUS POLYMER SOLUTION

Wayne E. Luetzelschwab, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Aug. 16, 1988, Ser. No. 232,726

Int. Cl.[5] C08F 6/06

U.S. Cl. 523—306 8 Claims



1. In a process for the preparation of an aqueous polymer solution utilizing a vessel into which monomer, water, and initiator are fed to form a reaction mixture which is transferred to a reactor to form the aqueous polymer solution, the improvement comprising the steps of:

providing static mixer means in a fluid conduit through which said aqueous polymer solution is flowing;

providing heat transfer means contiguous to the fluid conduit to remove heat from the aqueous polymer solution flowing through the static mixer means, the heat transfer means utilizing cooling water to effect the heat transfer; and

introducing heated water from the heat transfer means into the vessel to function as reaction water in the process.

4,965,299

INLAID AGGREGATE PLASTIC FLOOR TILE

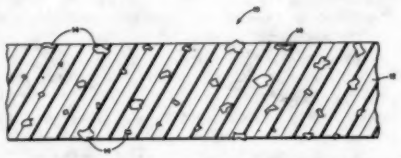
Walter C. Timm, Cornwall, and Michael H. McNally, New Windsor, both of N.Y., assignors to Tarkett AB, Ronneby, Sweden

Filed Sep. 27, 1989, Ser. No. 413,208

Int. Cl.[5] C08L 27/04, 27/06

U.S. Cl. 523—437 13 Claims

1. A tile composition formed with resinous chips which are partially cross-linked to allow such chips to remain discrete during processing, comprising a tile base containing (a) about 10 to 25 weight percent of thermoplastic polymer in the form of polyvinyl chloride homopolymer or a vinyl chloride copolymer in which the vinyl chloride portion is predominant, (b) about 50 to 85 weight percent of filler material and (c) a lubricant component, said tile base having uniformly dispersed therein about 2 to 10 weight percent of the composition of particulate materials in the form of thermoplastic chips containing (a) about 25 to 80 weight percent of thermoplastic polymer in the form of polyvinyl chloride homopolymer or a



vinyl chloride copolymer in which the vinyl chloride portion is predominant, (b) about 10 to 75 weight percent of filler material and (c) a plasticizer selected from the group consisting of phenolic resin, polyester or epoxy resin, each of said chips being cross-linked in an amount of from about 18 weight percent of the polymeric phase to an amount not greater than an amount which prevents flowing at elevated temperatures.

4,965,300

SEQUENTIAL COPOLYMERS BASED ON CYCLIC CARBONATES AND ESTERS

Herbert Eichenauer; Edgar Leitz, both of Dormagen, and Karl-Heinz Ott, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 139,276, Dec. 29, 1987, abandoned. This application Nov. 27, 1989, Ser. No. 443,041

Claims priority, application Fed. Rep. of Germany, Jan. 6, 1987, 3700193

Int. Cl.[5] C08G 63/64

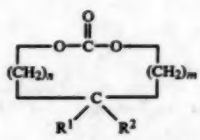
U.S. Cl. 525—415 15 Claims

1. A sequential polymer corresponding to the idealized formula (I)

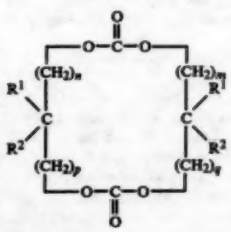
$$[A\text{-}X\text{-}B]_r \quad (I)$$

with r=1 to 20, in which

-A- is a polymer of a cyclic carbonate corresponding to the general formula (II) and/or (III) below

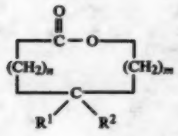


(II)



(III)

-B- is a polymer of a lactone corresponding to the general formula (IV) below



(IV)

X is a central link, containing both the cyclic carbonate of formula (II) and/or (III) and the lactone of formula (IV) in polymerized form, the concentration of the residues of (II) and/or (III) decreasing continuously in the direction of -B- and the concentration of the residues (IV) decreasing continuously in the direction of -A- ("tapered structure"); in formulae (II), (III) and (IV), m, n, p and q independently of one another have the values 0, 1, 2, 3, 4, 5 or 6, with the proviso that the sum of n+m in (II) is at least 1, the sum of n+m in (IV) is at least 1 and the sums of n+p and m+q in (III) are at least 1, and R^1 and R^2 represent H, C_1–C_6 alkyl, C_3–C_6 alkenyl or C_1–C_6 alk(en)yloxy-C_1–C_6-alkyl.

4,965,301

STABILIZATION OF POLYOLEFINS

James C. Leininger, Mauldin, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 677,421, Dec. 3, 1984, abandoned. This application Mar. 7, 1988, Ser. No. 186,264

Int. Cl.[5] C08K *5/3492, 3/32*

U.S. Cl. 524—101 **23 Claims**

1. A stabilizer, useful in spun poly(α-olefin) fibers, comprising effective weight ratios of (A) at least one hindered phenol, (B) at least one organic phosphite, (C) at least one hindered amine, (D) at least one metal soap, defined as a Group IA, IIA, or IIB metal salt of a long-chain fatty acid, and (E) trisodium phosphate and provided in a range of from about 0.005 to about 0.25 parts by weight per 100 parts by weight polymer.

4,965,302

THERMOPLASTIC POLYESTER RESIN COMPOSITION AND MOLDED ARTICLES PRODUCED THEREFROM

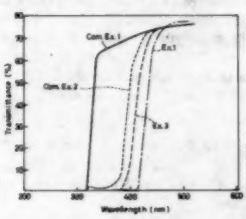
Takuji Hirahara, Kawasaki; Takashi Nakamura, Sagamihara; Yoshiko Kumeno, Yokohama; Takayuki Ohta, Sagamihara, and Tetsuo Kasai, Machida, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Mar. 23, 1989, Ser. No. 328,093

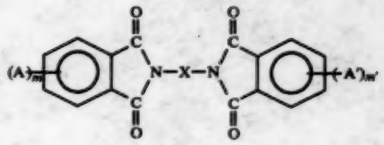
Claims priority, application Japan, Mar. 29, 1988, 63-73421; Mar. 29, 1988, 63-73424

Int. Cl.[5] C08K *5/3417, 5/353, 5/15*

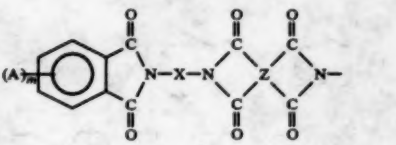
U.S. Cl. 524—83 **14 Claims**



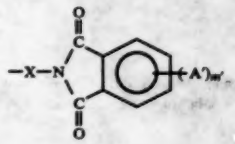
1. A thermoplastic polyester molded article comprising a thermoplastic polyester and an effective amount for ultraviolet screening of at least one diimide compound selected from the group consisting of compounds represented by the following formulae (I) and (II):



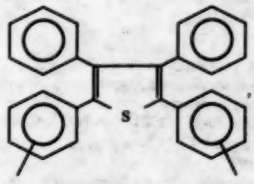
(I)

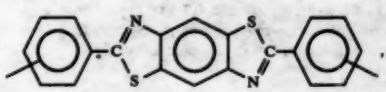


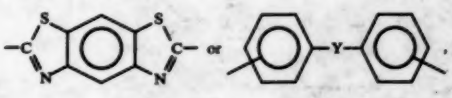
(II)

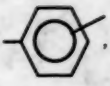


wherein m and m′ represent independently an integer from 0 to 4; A and A′ represent independently a member selected from the group consisting of halogen, —COOH and esters thereof, —OH, —O—C(=O)CH_3, —NH_2, —CN, —NO_2, —SO_3H and metal salts thereof, alkoxyl group, aliphatic group, and aromatic group, and when m and/or m′ is 2 to 4, A and A′ may be the same or different from each other; X represents







wherein Y represents SO_2, C=O, —CH=CH—, 

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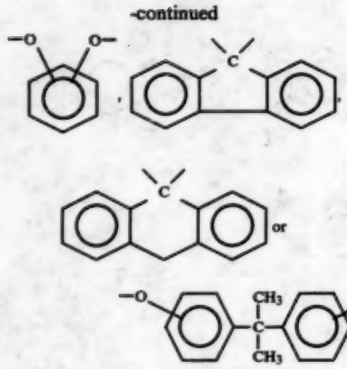
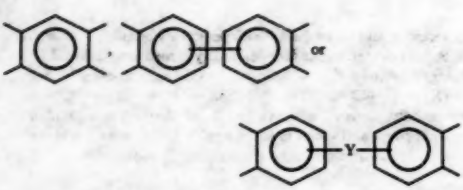


and the aromatic group contained in X may be substituted with a substituent represented by A or A'; and Z represents



wherein Y is the same as defined above, and the aromatic group contained in Z may be substituted with a substituent represented by A or A'.

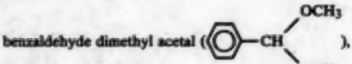
4,965,303

POLYCARBONATE COMPOSITION

Kazuo Kishimoto, Matsuyama, Japan, assignor to Teijin Chemicals, Ltd., Tokyo, Japan

Filed Aug. 3, 1989, Ser. No. 389,304
Int. Cl.[5] C08K 5/15, 5/07
U.S. Cl. 524—107 10 Claims

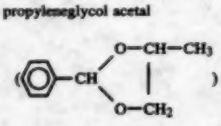
1. A polycarbonate composition comprising 100 parts by weight of polycarbonate and 0.1 to 1.0 part by weight of at least one anti-yellowing compound selected from the group consisting of itaconic acid, itaconic anhydride,



benzaldehyde dimethyl acetal (

),

benzaldehyde propyleneglycol acetal



) and p-phthalaldehyde.

4,965,304

EXTRUDABLE POLYMERIC COMPOSITIONS

James R. Bethea, Denham Springs, La., and Stephen R. Betso, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 5, 1988, Ser. No. 215,177
Int. Cl.[5] C08K 5/53
U.S. Cl. 524—123 17 Claims

1. A polymeric composition comprising:

(A) a vinylidene chloride interpolymer formed from a monomer mixture comprising vinylidene chloride in an amount of from about 60 to about 99 percent, said monomer weight percent being based on the total weight of the monomer mixture; and at least one monoethylenically unsaturated monomer copolymerizable therewith selected from the group consisting of vinyl chloride, alkyl acrylates, alkyl methacrylates, acrylic acid, methacrylic acid, itaconic acid, acrylonitrile and methacrylonitrile, said ethylenically unsaturated comonomer being maintained in an amount below an amount effective to destroy the semi-crystalline character of the interpolymer; and

(B) an extrusion formulation package comprising (1) an olefinic wax or oil in an amount of from about 0.1 to about 2 weight percent, based on the total weight of the polymeric composition, said olefinic wax or oil being a hydrocarbon having the general formula C_nH_{2n+2} and a molecular weight of from about 500 to about 9000; and (2) at least one other additive selected from the group consisting of (a) from about 0.01 to about 5 weight percent, based on the total weight of the polymeric composition, of a salt of an acid having a weight average particle diameter of from about 1 to about 50 microns, said salt being selected from the group consisting of inorganic acids and organo phosphates, and (b) from about 0.01 to about 10 weight percent of a polyolefin capable of lowering the frictional coefficient and the mechanical energy to extrude of the polymeric composition, said polyolefin being selected from the group of olefin homopolymers and interpolymers having a melting point of from about 70°C. to about 175° C. and a density of from about 0.85 to about 1.1g/cc.

4,965,305

HOT MELT COATINGS MADE FROM A NOVEL PETROLEUM WAX

Richard L. Jones, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Nov. 30, 1988, Ser. No. 278,911
Int. Cl.[5] C08L 91/08
U.S. Cl. 524—349 11 Claims

1. A wax composition which comprises (a) from about 50 weight percent to about 90 weight percent of a recrystallized heavy intermediate petroleum wax having a melting point of from about 155° F. to about 185° F., and a clear color; and (b) from about 10 weight percent to about 30 weight percent of a polymeric hydrocarbon compound selected from the group consisting of ethylene-vinyl acetate copolymer, ethylene-ethyl acrylate copolymer, polypropylene and mixtures thereof having a molecular weight of from about 2,000 to about 100,000 and a melt index of from about 1 to about 250 at 375° F.

4,965,306

PROCESS FOR PRODUCING HOT MELT WAX COMPOSITIONS

Richard L. Jones, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Feb. 6, 1989, Ser. No. 307,655
Int. Cl.[5] C08K 5/13; C08L 25/14, 91/06, 91/08
U.S. Cl. 524—351 9 Claims

1. A process for producing a wax composition which comprises:

(a) vacuum distilling a petroleum crude oil to prepare a 90 to 350 distillate paraffinic petroleum wax, having a melting

point range of from about 120° F. to about 160° F., a 650 distillate heavy intermediate petroleum wax, having a melting point range of from about 145° F. to about 185° F., and a microcrystalline petroleum wax from the resid having a melting point range of from about 150° F. to about 200° F.,

(b) subjecting the paraffinic petroleum wax, heavy intermediate petroleum wax and microcrystalline petroleum wax from step (a) to furfural/duosol solvent extraction,

(c) separately dissolving and crystallizing the paraffinic, heavy intermediate and microcrystalline petroleum waxes from step (b) from a methyl ethyl ketone/toluene mixed solvent,

(d) separately redissolving and recrystallizing the paraffinic, heavy intermediate and microcrystalline petroleum waxes from step (c) from a methyl ethyl ketone/toluene mixed solvent,

(e) separately percolating the fully refined recrystallized paraffinic, recrystallized heavy intermediate and recrystallized microcrystalline petroleum waxes from step (d) in the molten state through a clay bed; and

(f) mixing the fully refined paraffinic petroleum wax from step (e) with the heavy intermediate wax or the microcrystalline wax or a mixture of the heavy intermediate wax and the microcrystalline wax from step (e) and from about 10 weight percent to about 30 weight percent of a polymeric compound selected from the group consisting of ethylene-vinyl acetate copolymer, ethylene-ethyl acrylate copolymer, polypropylene and mixtures thereof having a molecular weight of from about 2,000 to about 100,000 and a melt index of from about 1 to about 250 at 375° F.

4,965,307

POLYESTER FILM

Kazuo Okabe; Katsumi Bokuta, and Hiroyuki Morimoto, all of Shiga, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 7, 1988, Ser. No. 283,327

Claims priority, application Japan, Apr. 7, 1987, 62-85494; Apr. 8, 1987, 62-87531; Jan. 28, 1988, 63-18139

Int. Cl.[5] C08J 5/18

U.S. Cl. 524—425 **30 Claims**

1. A polyester film containing as fine particles at least calcium carbonate particles in an amount of not less than 0.005% by weight, wherein the particle size S_c (nm) of the polyester crystals, the crystal face orientation index X_I and the difference Δn between the refractive indices in the machine direction and in the transverse direction satisfy the following equation

$$5 \leq -6.36 - 0.284\ X_I + 2.54\ S_c - 26\ \Delta n$$

wherein, $X_I = \{I\ (110)/I\ (100)\} \times 100$,

$$\Delta n = n_{MD} - n_{TD}$$

wherein

I is intensity in a wide angle X-ray diffraction,

n_{MD} is the refractive index in the machine direction, and

n_{TD} is the refractive index in the transverse direction; and,

wherein the polyester film has a center line roughness Ra of 0.004–0.030 μm, a face orientation coefficient f_n of 0.1600–0.1750, a difference Δn of −0.055 to −0.025, and a F-5 value in the transverse direction of 13.5–16 kg/mm².

4,965,308

POLYMER MIXTURE COMPRISING AN AROMATIC POLYCARBONATE, AN AROMATIC POLYESTER AND AN INORGANIC SULFUR COMPOUND

Wilhelmus M. M. Roovers, Steenbergen, Netherlands, and Jeroen J. Verhoeven, Antwerpen, Belgium, assignors to General Electric Company, Pittsfield, Mass.

Filed May 25, 1988, Ser. No. 198,365

Int. Cl.[5] C08K 3/30

U.S. Cl. 524—421 **13 Claims**

1. A polymer mixture which comprises the following constituents:

A. 1–98.99% by weight of an aromatic polycarbonate,

B. 98.99–1% by weight of an aromatic polyester, and

C. 0.01–5% by weight of a stabiliser, characterised in that the polymer mixture comprises sulphuric acid or sulphurous acid as the stabiliser.

8. A polymer mixture which comprises the following constituents:

A. 1–98.99% by weight of an aromatic polycarbonate,

B. 98.99–1% by weight of an aromatic polyester, and

C. 0.01–5% by weight of a stabiliser, characterised in that the polymer mixture comprises a metal bisulphite, a metal hydrogen sulphate or a metal thio sulphate as the stabiliser.

4,965,309

SMOKE SUPPRESSANT COMPOSITIONS FOR HALOGEN-CONTAINING PLASTICS AND METHODS OF USING

Vern H. Batdorf, Minneapolis, Minn., assignor to H. B. Fuller Company, St. Paul, Minn.

Continuation of Ser. No. 116,648, Nov. 4, 1987, abandoned. This application Apr. 10, 1989, Ser. No. 336,562

Int. Cl.[5] C08K 3/24, 3/32

U.S. Cl. 524—405 **26 Claims**

1. A polymeric rigid polyvinyl chloride resin composition comprising:

(a) a major proportion of a rigid polyvinyl chloride; and

(b) a smoke suppressant composition comprising:

(i) an effective smoke suppressing amount up to about 80 parts by weight of a diluent selected from the group consisting of talc, wollastonite, mica, feldspar, an alkaline earth sulfate, an alkali metal aluminum silicate, an alkali metal carbonate, a zinc sulfate or mixtures thereof;

(ii) about 1 to 8 parts by weight of zinc in the form of an inorganic zinc compound;

(iii) about 1 to 6 parts by weight of magnesium in the form of an inorganic magnesium compound other than magnesium oxide; and

(iv) about 0.7 to 7 parts by weight of molybdenum in the form of an inorganic molybdenum compound;

all parts be weight based upon the total amount of smoke suppressant; wherein the zinc compound, magnesium compound and molybdenum compound are incorporated onto the surface of the talc.

4,965,310

WEAR RESISTANT POLY (ARYL ETHER KETONE) POLYIMIDE BLENDS

James E. Harris, Piscataway, and John P. Gavula, Lebanon, both of N.J., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 716,401, Mar. 27, 1985, abandoned. This application Jul. 25, 1985, Ser. No. 758,774

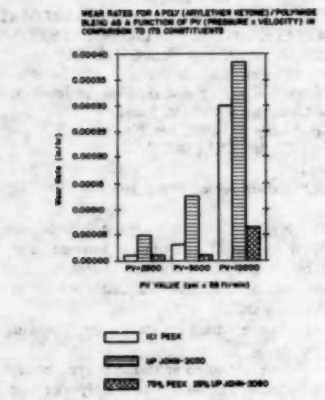
Int. Cl.[5] C08J 3/10; C08L 79/08

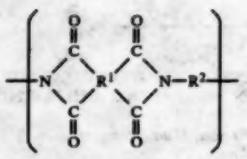
U.S. Cl. 524—406 **12 Claims**

1. A blend comprising

A. at least one poly(aryl ether ketone), and

B. at least one thermoplastic polyimide having repeating units of the formula





(I)

wherein

R^1 is a tetravalent radical having benzenoid unsaturation, and

R^2 is a divalent group having aromatic unsaturation, which polyimide is essentially free of (i) backbone ether oxygen bonded directly to the aromatic ring forming an imide linkage and (ii) amide linkages bonded through carboxyl groups bonded to the aromatic ring forming an imide linkage.

4,965,311

CURING COMPOSITION HAVING ENHANCING EFFECT ON DRYING CHARACTERISTICS OF ALKYD COATING

Toshifumi Hirose; Sadao Yukimoto, and Katsuhiko Isayama, all of Hyogo, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 2, 1989, Ser. No. 305,137

Claims priority, application Japan, Feb. 3, 1988, 63-23055

Int. Cl.[5] C08K *5/01*

U.S. Cl. 524—483 **8 Claims**

1. A curing composition having an enhancing effect on the drying characteristics of an alkyd coating, which comprises:

(A) an oxyalkylene polymer having at least one reactive silicon atom-containing group, said silicon atom-containing group having a hydroxyl group or a hydrolyzable group bound to a silicon atom, and being capable of crosslinking by forming a siloxane bond;

(B) a plasticizer selected from the group consisting of polymeric plasticizers having a molecular weight in the range of 500–15000 and non-polymeric plasticizers having a viscosity of at least 8 poise at 15° C.; and

(C) an air curing compound capable of curing said composition by reaction with atmospheric oxygen.

4,965,312

NONAQUEOUS VEHICLE COMPOSITION FOR COATING MATERIALS

Noboru Nakai, Hiratsuka; Osamu Isozaki, Yokohama, and Susumu Midogohchi, Hiratsuka, all of Japan, assignors to Kansai Paint Company, Limited, Hyogo, Japan

Filed Oct. 29, 1986, Ser. No. 924,477

Claims priority, application Japan, Nov. 1, 1985, 60-246898

Int. Cl.[5] C08L *83/07*

U.S. Cl. 524—506 **4 Claims**

1. A coating composition consisting of a non-aqueous dispersion comprising an organic liquid, particles of a vinyl polymer dispersed in the organic liquid, and a polymer of an alkoxysiloxane, wherein the alkoxy group has 3 to 5 carbon atoms, dissolved in the organic liquid,

said dispersion being prepared by polymerizing at least one vinyl monomer, selected from the group consisting of acrylic acid, methacrylic acid, acrylates, methacrylates, styrene, alphamethylstyrene, vinyltoluene, p-chlorostyrene, vinylpyridine, acrylonitrile, methacrylonitrile, methylisopropenyl ketone and vinyl acetate,

said organic liquid being capable of dissolving said vinyl monomer but incapable of dissolving said vinyl polymer obtained therefrom,

said alkoxysiloxane polymer being contained in a concentration of about 0.5 to about 70% by weight based on the combined weight of said alkoxysiloxane polymer and said vinyl polymer,

and said vinyl polymer and said alkoxysiloxane polymer being contained in the organic liquid in a combined concentration of about 30 to about 70% by weight.

4,965,313

NOVEL PHOTOCURABLE AND HEAT-CURABLE POLYVINYL BUTYRAL RESIN

Yoshiro Onda, Tokyo, and Soji Tanioka, Kanagawa, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

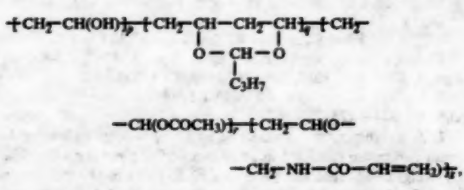
Filed Jun. 7, 1989, Ser. No. 363,619

Claims priority, application Japan, Jun. 24, 1988, 63-156314

Int. Cl.[5] C08F *8/00*

U.S. Cl. 525—59 **2 Claims**

1. A modified polyvinyl butyral polymer having photocurability and heat-curability containing an ethylenically unsaturated moiety which is represented by the general formula



in which p, q, r and z are each a positive integer.

4,965,314

OXYGEN BARRIER RESINS

Gerald M. Lancaster, Freeport; Tu-Anh Pham, and James A. Allen, both of Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 884,129, Jul. 10, 1986, Pat. No. 4,910,253. This application Jan. 29, 1990, Ser. No. 472,679

Int. Cl.[5] C08F *16/06*

U.S. Cl. 525—60 **1 Claim**

1. A mono- or multi-layered packaging film, sheet, injection-molded article or blow-molded article characterized by its HF-heatability and its low oxygen transmission rate, wherein said packaging film, sheet, injection-molded article or blow-molded article consists of a uniform blend of an ethylene/car-

bon monoxide copolymer and an ethylene/vinyl alcohol copolymer, wherein the carbon monoxide groups comprise more than about 1.5%, but less than about 15 mol% of the blend, the vinyl alcohol groups comprise more than 0 mol %, but not more than about 61 mol % of the blend, and the ethylene groups comprise the remainder of the blend.

4,965,315

THERMOPLASTIC RESIN COMPOSITION

Tetsuro Maeda, Ichihara, and Akihiro Okamoto, Yokohama, both of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1985, Ser. No. 726,362

Claims priority, application Japan, May 25, 1984, 59-104732

Int. Cl.[5] C08L *51/04*

U.S. Cl. 525—86 9 Claims

1. A thermoplastic resin composition composed of a mixture comprising a graft polymer obtained by subjecting a monomer mixture of an aromatic vinyl monomer and a vinyl cyanide monomer to emulsion polymerization employing an emulsifier in the presence of a diene rubber latex of agglomerated diene rubber particles and recovering said graft polymer by use of a precipitation agent, and a hard polymer obtained by copolymerizing a monomer mixture of an aromatic vinyl monomer and a vinyl cyanide monomer, in which the number average particle size Dn of diene rubber particles contained in the composition is at most 0.1 μm, the ratio (Dw/Dn) of the weight average particle size Dw to the number average particle size Dn of the diene rubber particles is at least 5.0, the graft rate of said graft polymer is at least 60%, and the content of said emulsifier and the reaction product of a emulsifier with said precipitation agent is not higher than 2% by weight.

4,965,316

RADIATION SENSITIVE POLYMERS AND USE THEREOF

Alfred Steinmann, Praroman, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

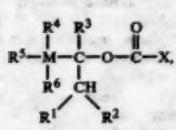
Filed Aug. 29, 1988, Ser. No. 237,472

Claims priority, application Switzerland, Sep. 7, 1987, 3426/87

Int. Cl.[5] C08F *8/00*; C08L *83/00*

U.S. Cl. 525—100 10 Claims

1. A polymer having groupings of the formula I



(I)

in which R^1 to R^6 independently of one another are C_1–C_4alkoxy, phenyl, benzyl, phenoxy, a group of $-M(R^8)_3$ pr

or R^3 and R^4 together are

and in addition R^1 and R^3 can also be hydrogen atoms, R^8 is C_1–C_4alkyl, C_1–C_4alkoxy, phenyl, benzyl or phenoxy, M is Si, Ge, Sn, CH_2Si or OSi and X is O, S or NR', where R' is hydrogen or a single bond, b is a whole number from 1 to 6 and c is a whole number from 3 to 6, and an average molecular weight between 1,000 and 1,000,000.

4,965,317

COATING COMPOSITION WITH SAG CONTROL AGENT

Charles M. Kania, Natrona Heights; Carl C. Anderson, Allison Park, and Brij N. Sharma, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 16, 1989, Ser. No. 422,166

Int. Cl.[5] C08L *61/00*; B32B *27/00*

U.S. Cl. 525—155 16 Claims

1. An improved coating composition comprising (a) a reactive polymer film-forming binder; and (b) a polyurea sag control agent characterized in that the polyurea sag control agent is a urea functional free radical addition polymer and wherein the polyurea sag control agent is present in the amount of from about 8 to about 10 percent by weight of the composition based on the weight of resin solids.

2. The coating composition of claim 1 wherein the polyurea sag control agent is a reaction product of an isocyanate functional acrylic polymer with an amine selected from the group consisting of primary amines, secondary amines and mixtues thereof.

4,965,318

THERMOPLASTIC MOLDING MATERIALS BASED ON NYLONS AND STYRENE COPOLYMERS

Christof Taubitz, Wachenheim; Erhard Seiler, Ludwigshafen; Juergen Hambrecht, Münster-Hiltrup; Konrad Mitulla, Ludwigshafen, and Horst Reimann, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 10,437, Feb. 3, 1987, abandoned. This application Jul. 14, 1988, Ser. No. 218,977

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1986, 3604349

Int. Cl.[5] C08L *77/00*

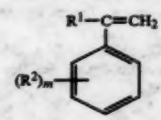
U.S. Cl. 525—179 4 Claims

1. A thermoplastic molding material containing

(A) from 5 to 95% by weight of a nylon and

(B) from 5 to 95% by weight of a random copolymer prepared by copolymerization, composed of

(B_1) from 50 to 99.9% by weight of a copolymerization styrene of the formula I



(I)

or mixtures of styrenes of the formula (I) where R^1 is alkyl or 1 to 4 carbon atoms or hydrogen, R^2 is alkyl of 1 to 6 carbon atoms or halogen and m is 0, 1, 2 or 3,

(B_2) from 0.1 to 30% of a copolymerized monomer copolymerizable with a styrene of formula (I) containing a lactam group present in a moiety (VI)

(VI)

in said manner where R^3 is a divalent, branched or straight-chain alkylene group of 2 to 15 carbon atoms, and

(B_3) from 0 to 48% by weight of further copolymerized comonomers selected from the group consisting of acrylo-

nitrile, methacrylonitrile, alkyl acrylates and alkyl methacrylates wherein alkyl is of 1 to 12 carbon atoms, and

(C) from 0 to 50% by weight, based on (A) and (B) of an impact-modifying rubber.

4,965,319

POLYMER COMPOSITION

Manabu Kawamoto, Chiba, Japan, assignor to Du Pont-Mitsui Polychemicals Co., Ltd., Tokyo, Japan

PCT No. PCT/JP89/00171, § 371 Date Jun. 2, 1989, § 102(e) Date Jun. 2, 1989, PCT Pub. No. WO89/07624, PCT Pub. Date Aug. 24, 1989

PCT Filed Feb. 21, 1989, Ser. No. 372,384

Claims priority, application Japan, Feb. 22, 1988, 63-37645

Int. Cl.[5] C08L *23/26, 23/16, 33/02*

U.S. Cl. 525—194 4 Claims

1. A polymer composition which comprises from 50 to 85 parts by weight of an ethylene-type ionomer resin (A), A_1 from 10 to 39 parts by weight of a partially crosslinked olefin-type thermoplastic elastomer (B) B_2 and from 1 to 15 parts by weight of an ethylene/alpha-olefin copolymer rubber (C).

4,965,320

POLYETHYLENE ALKYL ACRYLATE ADHESIVE COMPOSITION

Noel M. M. Overbergh, Rotselaar, Belgium, assignor to Raychem Corporation, Menlo Park, Calif.

Filed Feb. 27, 1989, Ser. No. 316,006

Claims priority, application United Kingdom, Feb. 25, 1988, 8804408

Int. Cl.[5] C08L *23/08, 35/02, 33/08*

U.S. Cl. 525—207 21 Claims

1. A hot-melt adhesive composition which is not crosslinked, comprising a mixture of:

(a) 25–40 parts by weight of a terpolymer of ethylene, alkyl acrylate and maleic anhydride and having a melt flow index as determined according to ASTM D1238-70 of at least 40; and

(b) 25–70 parts by weight of a copolymer consisting essentially of ethylene and alkyl acrylate having a melt flow index as determined according to ASTM D1238-70 of at least 40.

4,965,321

THERMOPLASTIC COPOLYMER

Masahiro Yuyama; Teruhisa Koyama; Hideaki Matsurra, and Shinji Date, all of Niihama, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

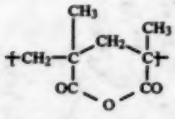
Filed Jul. 28, 1988, Ser. No. 225,289

Claims priority, application Japan, Jul. 30, 1987, 62-191941; Mar. 24, 1988, 63-071465

Int. Cl.[5] Q08F *220/02*

U.S. Cl. 525—329.7 9 Claims

1. A thermoplastic copolymer which comprises (a) 2.0 to 22.0% by weight of a methyl methacrylate unit, (b) 38.0 to 70.0% by weight of a styrene unit, and 20.0 to 45.0% by weight in total of both (c) a methacrylic acid unit and (d) an acid anhydride unit having a 6-membered ring structure of the formula:



said acid anhydride unit having a 6-membered ring structure being in an amount of not less than 16.0% by weight per total amount of the units (c) and (d), and said copolymer having a reduced viscosity of 0.3 to 1.5 dl/g (measured in a 1% solution in dimethylformamide at 25° C.).

4,965,322

PHOTOSENSITIVE AND HEAT-SENSITIVE POLYMERS, PROCESS FOR PRODUCING THE SAME AND PROCESS FOR RECORDING INFORMATION USING THE SAME

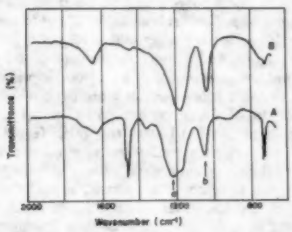
Yasuki Shimamura, Fuji, and Jyoji Ihata, Mishima, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 22, 1988, Ser. No. 171,590

Claims priority, application Japan, Apr. 6, 1987, 62-83071; Apr. 16, 1987, 62-91964; Apr. 20, 1987, 62-95055; May 18, 1987, 62-118865; Jun. 1, 1987, 62-134934; Jun. 12, 1987, 62-145235; Jul. 10, 1987, 62-171074; Jul. 15, 1987, 62-174899

Int. Cl.[5] C08C *19/70*; C08F *8/36, 36/04*

U.S. Cl. 525—332.6 8 Claims



1. A process for producing a photosensitive and heat-sensitive polymer which comprises

sulfonating a polymer of an ethylenically unsaturated monomer having a number average molecular weight of at least 10,000 or a polymer having conjugated polyenes and a number average molecular weight of at least 10,000 selected from the group consisting of (a) a homopolymer or copolymer of a halogenated olefin having 2 to 3 carbon atoms and a copolymer of the halogenated olefin and an olefin having 2 to 8 carbon atoms; (c) a homopolymer or copolymer of an olefin having a polar group and a copolymer of the olefin having a polar group and an olefin having 2 to 8 carbon atoms; (d) a crosslinked aromatic polymer comprising 50 to 98% by mol of a monovinyl or monovinylidene aromatic monomer unit and 2 to 50% by mol of a polyvinyl monomer unit; and (e) a homopolymer or copolymer having conjugated polyenes of at least 3 sequence lengths with fuming sulfuric acid or sulfuric anhydride at a temperature of −30° C. to 70° C., and treating the sulfonated polymer with an oxidizing agent to produce a photosensitive and heat-sensitive polymer having conjugated polyenes and sulfonic acid groups and an absorbance ratio of a strong band in the region of 1200 cm^{-1} to 1300 cm^{-1} assignable to sulfonic acid groups adjacent to conjugated polyenes of at least 3 sequence lengths to a strong band near 1050 cm^{-1} assignable to sulfonic acid groups in the IR spectrum of at least 0.6.

8. A process for producing a photosensitive and heat-sensitive polymer which comprises

sulfonating a polymer of an ethylenically unsaturated monomer having a number average molecular weight of at least 10,000 or a polymer having conjugated polyenes and a number average molecular weight of at least 10,000 and selected from the group consisting of (a) a homopolymer or copolymer of an olefin having 2 to 8 carbon atoms; (b) a homopolymer or copolymer of a halogenated olefin having 2 to 3 carbon atoms and a copolymer of the halogenated olefin and an olefin having a polar group and a copolymer of the olefin having a polar group and an olefin having 2 to 8 carbon atoms; (d) a crosslinked aromatic polymer comprising 50 to 98% by mol of a monovinyl or

monovinylidene aromatic monomer unit and 2 to 50% by mol of a polyvinyl monomer unit; and (e) a homopolymer or copolymer having conjugated polyenes of at least 3 sequence lengths with fuming sulfuric acid or sulfuric anhydride at a temperature of −30° C. to 70° C. and treating the sulfonated polymer with an aqueous silver nitrate solution or an aqueous copper chloride solution to convert the sulfonic acid groups to silver sulfonate groups or copper sulfonate groups to produce a photosensitive and heat-sensitive polymer having conjugated polyenes and sulfonic acid groups and an absorbance ratio of a strong band in the region of 1200 cm^{-1} to 1300 cm^{-1} assignable to sulfonic acid groups adjacent to conjugated polyenes of at least 3 sequence lengths to a strong band near 1050 cm^{-1} assignable to sulfonic acid groups in the IR spectrum of at least 0.6.

4,965,323

METHOD OF VULCANIZING RUBBER AT PH 5 TO 10

Noboru Watanabe, and Yoichiro Kubo, both of Yokohama, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 765,723, Aug. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 610,971, May 16, 1984, abandoned. This application Jun. 1, 1987, Ser. No. 57,702

Claims priority, application Japan, May 17, 1983, 58-84928

Int. Cl.[5] *C08C 19/20; C08K 5/14*

U.S. Cl. 525—349 **4 Claims**

1. A method for improving compression set of a vulcanizate of a random nitrile group-containing hydrocarbon rubber having an ionine value of not more than 120, said method comprising adjusting the pH of said rubber, as measured in a solution of the rubber in tetrahydrofuran, to at least 5 to about 10, and vulcanizing the pH adjusted rubber using a sulfur vulcanizing system or an organic peroxide curing system.

4,965,324

SUBSTITUTED PHENOL-FORMALDEHYDE NOVOLAC RESINS CONTAINING REDUCED QUANTITIES OF 2-FUNCTIONAL COMPONENTS AND EPOXY NOVOLAC RESINS PREPARED THEREFROM

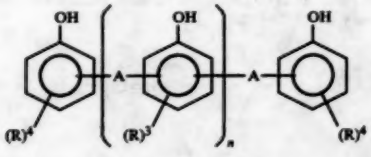
James L. Bertram, Lake Jackson; Louis L. Walker, Clute; Avis L. McCrary, and Fermin M. Cortez, both of Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 186,272, Apr. 26, 1988, abandoned, which is a division of Ser. No. 16,046, Feb. 18, 1987, Pat. No. 4,755,568, which is a continuation-in-part of Ser. No. 690,702, Jan. 11, 1985, abandoned. This application Nov. 17, 1989, Ser. No. 440,550

Int. Cl.[5] *C08G 8/04*

U.S. Cl. 525—507 **38 Claims**

1. A curable mixture comprising (I) an epoxy novolac resin resulting from epoxidizing a composition consisting of (A) the novolac resin which results from removing at least about 25 weight percent of the 2-functional component from a novolac resin represented by the following formula



wherein each A is independently a divalent hydrocarbon group or a divalent hydrocarabon group substituted with any inert substituent group; each R is independently hydrogen, a halogen atom, a hydroxyl group or a hydrocarbon or hydrocarbyloxy group having from about 1 to about 9 carbon atoms and n has an average value of from 0.5 to about 10; with the proviso that more than 50 percent of the aromatic rings has at least one R group which is other than hydrogen; with (B) an epihalohydrin; and (II) a suitable curing agent therefor.

4,965,325

STAIN RESISTANT POLYMERS & TEXTILES

Theodor A. Liss, and Leonard H. Beck, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 124,866, Nov. 23, 1987, which is a continuation-in-part of Ser. No. 943,335, Dec. 31, 1986, abandoned, which is a continuation-in-part of Ser. No. 829,230, Feb. 14, 1986, abandoned. This application Apr. 5, 1990, Ser. No. 505,343

Int. Cl.[5] *C08G 8/10, 8/28, 8/32*

U.S. Cl. 525—508 **8 Claims**

1. A process for preparing a modified polymeric sulfonated phenol-formaldehyde condensation product having a reduced tendency to turn yellow and which will provide stain resistance to synthetic polyamide textile substrates which comprises acylating or etherifying a portion of the free hydroxyl groups in a sulfonated phenol-formaldehyde condensation product at a pH between about 7 and 13 to provide a water-insoluble modified polymeric sulfonated phenol-formaldehyde condensation product comprising one in which (a) about 10 to 25% of the polymer units contain $SO_3(-)$ radicals and about 90 to 75% of the polymer units contain sulfone radicals and (b) a portion of the free hydroxyl groups thereof has been acylated or etherified, the number of said hydroxyl groups which has been acylated or etherified being sufficient to inhibit yellowing of said condensation product but insufficient to reduce materially the capacity of said condensation product to impart stain resistance to a synthetic polyamide textile substrate.

4,965,326

PROCESS FOR DEACTIVATING POLYMERIZATION-INDUCING RADICALS

Gerhard Hörpel, Nottuln, and Joachim Pangratz, Dorsten, both of Fed. Rep. of Germany, assignors to Bunawerke Hüls GmbH, Marl, Fed. Rep. of Germany

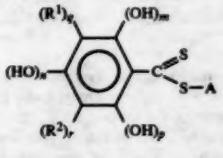
Filed Sep. 21, 1989, Ser. No. 410,460

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1988, 3836777

Int. Cl.[5] *C08F 2/42*

U.S. Cl. 526—84 **17 Claims**

1. A process for deactivating polymerization inducing radicals formed prior to or during a radical-induced polymerization which comprises contacting a radical-forming monomer or mixture of radical-forming monomers or a polymerization batch comprising same with a stopping agent which is an aromatic hydroxy compound of the general formula



wherein

m, n, p, q and r each are the integer 0 and 1, with the proviso that at least one of m, n, and p is 1;

R^1 and R^2 each are selected from the group consisting of alkyl of 1 to 10 carbon atoms, alkenyl of 1 to 10 carbon atoms, and aralkyl of up to 15 carbon atoms; and

A is hydrogen, ammonium or alkali metal.

4,965,327

SYNTHESIS OF POLYDIENE RUBBER BY HIGH SOLIDS SOLUTION POLYMERIZATION

Robert W. Stachowiak, Akron; Anthony J. Puccio, Tallmadge, and Thomas J. Eberhart, Cuyahoga Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 23, 1989, Ser. No. 425,655

Int. Cl.[5] C08F *2/06, 36/06, 36/08*

U.S. Cl. 526—88 **19 Claims**

1. A process for the synthesis of polydiene rubber by continuous high solids solution polymerization which comprises: (1) continuously charging at least one diene monomer, at least one organolithium compound, and from about 4 to about 50 phm of at least one organic solvent into a reaction zone wherein the reaction zone is in a reactor/extruder; (2) allowing the monomers to polymerize to a conversion of at least about 90% while utilizing conditions under which there is sufficient evaporative cooling in said reaction zone to maintain a temperature within the range of about 10° C. to about 150° C.; and (3) continuously withdrawing said polydiene rubber from the reaction zone.

4,965,328

PREPARATION OF PASTE FORMING VINYL CHLORIDE POLYMERS WITH HIGH PRESSURE HOMOGENIZATION

Burkhard Boeke; Josef Kalka, both of Haltern, and Hermann Winter, Marl, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 881,746, Jul. 3, 1986, abandoned, which is a continuation of Ser. No. 750,244, Jul. 1, 1985, abandoned, which is a continuation of Ser. No. 551,033, Nov. 14, 1983, abandoned. This application Aug. 16, 1989, Ser. No. 394,455

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1982, 3242088

Int. Cl.[5] C08F *2/24*

U.S. Cl. 526—212 **15 Claims**

1. A process for preparing a paste-forming polymer of vinyl chloride and 0–30% by weight of a copolymerizable monomer comprising discontinuously polymerizing the monomer in the presence of a water-soluble catalyst, and an emulsifier system of an emulsifier and a long chain alcohol, wherein the emulsifier system comprises:

(a) 0.2 to 3.0% by weight based on the total monomer weight of an alkali metal salt or an ammonium salt of a fatty acid of 12 to 18 C atoms, of an alkylsulfonic acid of 10 to 20 C atoms, of an alkylphenylsulfonic acid of 8 to 18 C atoms in the alkyl portion or a sulfosuccinic acid alkyl ester of 6 to 14 C atoms in each alkyl portion,

(b) 50 to 200% by weight based on the weight of (a) above of a C_{12}–C_{20} alkanol, and

(c) water,

comprising

homogenizing the emulsifier system, mixing the homogenized mixture with the monomers to be polymerized and then polymerizing the monomers,

the total amount of water in the polymerization being such that the weight ratio of total monomer to total water is 1:0.5 to 1:1.6, and the amount of catalyst being catalytically effective, wherein the homogenization is conducted by means of a high-pressure homogenizer using pressures from 500 to 200 bar and a time of 1 to 10 minutes, whereby the homogenization of the emulsifier system is such that samples thereof on the order of 0.001–0.004 μm^3 have the same compositional analysis.

4,965,329

N-SUBSTITUTED ARYLCYCLO BUTENYL-UNSATURATED CYCLIC IMIDES

Robert A. Kirchhoff, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

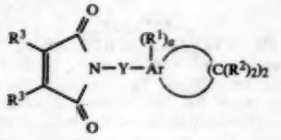
Division of Ser. No. 893,125, Aug. 4, 1986, Pat. No. 4,826,997, which is a continuation-in-part of Ser. No. 644,849, Aug. 27, 1984, abandoned. This application Jan. 13, 1989, Ser. No. 297,804

The portion of the term of this patent subsequent to Nov. 8, 2005, has been disclaimed.

Int. Cl.[5] C08F *26/06*

U.S. Cl. 526—259 **9 Claims**

1. A polymeric composition which comprises a polymer of one or more compounds which correspond to the formula



wherein

Ar is an aromatic radical:

R^1 is separately in each occurrence a hydrocarbyl, hydrocarbyloxy, hydrocarbylthio, an electron-donating or electron-withdrawing group;

R^2 is separately in each occurrence hydrogen, cyano. halo or an electron donating group;

R^3 is separately in each occurrence hydrogen, a hydrocarbyl, hydrocarbyloxy or hydrocarbylthio group;

Y is a direct bond or a divalent organic radical; and

a is an integer of from 0 to 3; with the proviso that the two carbon atoms of the $(C(R^2)_2)_2$ moiety which are bound to Ar are bound to adjacent carbon atoms on the same aromatic ring of Ar; with the further proviso that the moieties R^1, R^2 and R^3 do not interfere with the polymerization of the compound.

4,965,330

NORBORNENE DICARBOXIMIDE POLYMER

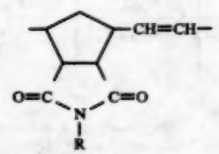
Jawed Asrar, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 67,562, Jun. 26, 1987, abandoned. This application Oct. 7, 1988, Ser. No. 256,212

Int. Cl.[5] C08F *26/06*

U.S. Cl. 526—259 **3 Claims**

1. A polymer comprising norbornene dicarboximide units essentially of the formula



CH =CH C =0 0 =C N R

where R is phenyl or substituted phenyl; wherein said polymer has an number average molecular weight greater than about 6,000 and a Tg greater than about 200° C.

4,965,331

CURABLE RESIN COMPOSITIONS

Roy J. Jackson, and Anthony M. Pigneri, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 312,839, Feb. 21, 1989, abandoned. This application Jan. 26, 1990, Ser. No. 471,032

Int. Cl.[5] C08F 22/40

U.S. Cl. 526—262 7 Claims

1. A curable resin composition comprising

(a) a maleimide monomer, a prepolymer thereof or a prepolymer of a maleimide and an amine; and

(b) a dipropargyl ether of bisphenol A.

4,965,332

SILYL- AND DISILANYL-1,3-BUTADIYNE POLYMERS FROM HEXACHLORO-1,3-BUTADIENE

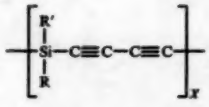
Thomas J. Barton, and Sina Ijadi-Maghsoodi, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed May 16, 1989, Ser. No. 352,825

Int. Cl.[5] C08G 77/04

U.S. Cl. 528—25 23 Claims

1. An organosilicon polymer having recurring silylene-1,3-butadiyne units of the formula:



wherein X is an integer from 20 to 500 and R and R′ are organic moieties or hydrogen.

4,965,333

RTV ORGANOPOLYSILOXANE COMPOSITIONS

Yoshio Inouye, Annaka; Takeo Inoue, Yokohama, and Koji Yokoo, Tomioka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 286,735

Claims priority, application Japan, Dec. 21, 1987, 62-323615

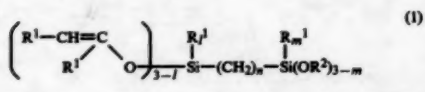
Int. Cl.[5] C08G 77/04

U.S. Cl. 528—33 6 Claims

1. A room temperature vulcanizable organopolysiloxane composition comprising:

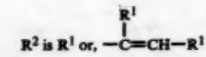
(a) a diorganopolysiloxane blocked with a silanol, dialkoxy or trialkoxy radical at both ends of the molecular chain thereof,

(b) an oragnic silicon compound of the general formula:



(I)

wherein R^1 is hydrogen or a monovalent hydrocarbon radical having 1 to 8 carbon atoms,



R^2 is R^1 or, $-C=CH-R^1$

m and l are independently equal to 0, 1 or 2, and n is an integer in the range of 2 to 8, and (c) a curing catalyst.

4,965,334

COPOLYMERS OF POLYSILYL COMPOUNDS AND ANTI-GELLING AGENTS

Paul H. Mohr, Chappaqua, and Enrico J. Pepe, Amawalk, both of N.Y., assignors to First Brands Corporation, Danbury, Conn.

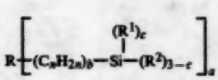
Division of Ser. No. 893,803, Aug. 6, 1986, Pat. No. 4,775,415. This application Aug. 5, 1988, Ser. No. 229,698

Int. Cl.[5] C08G 77/04

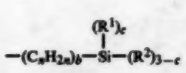
U.S. Cl. 528—34 14 Claims

1. A copolymer formed by the reaction of

(a) a polysilyl compound of the formula:



wherein R is a substituted or unsubstituted organic radical; R^1 is selected from the group consisting of hydrogen, monovalent hydrocarbon radicals and substituted monovalent hydrocarbon radicals; R^2 is a monovalent moiety hydrolyzable to a hydroxyl group, each R^2 being the same or different; a is an integer from 2 to 4, inclusive; b is an integer having a value of 0 or 1; n is an integer from 1 to 36, inclusive; and c is an integer having a value of 0 or 1; each



group being the same or different, with the provisio that the compound have at least one

group; and

(b) an anti-gelling agent.

4,965,335

HIGH-TEMPERATURE EXPANDING ORGANO-PHOSPHORUS MONOMER/POLYMERS

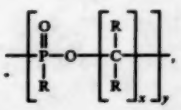
James D. B. Smith, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 20, 1989, Ser. No. 325,749

Int. Cl.[5] C08G 59/40, 79/04

U.S. Cl. 528—108 16 Claims

1. A method of producing high temperature organo-phosphorus polymers of the structure



wherein R is selected from the group comprising phenyl, benzyl, naphthalene, anthracene or arylalkyl groups, wherein x=1-12 and y is at least 10, said method comprising the steps of:

a. preparing an organo-phosphorous cyclic monomer;

b. opening said cyclic monomer with use of an acid catalyst;

c. curing said monomer to form said organo-phosphorus polymer, said polymer comprised of multiple monomeric units of said monomer, and said polymer exhibiting zero shrinkage.

4,965,336

HIGH PERFORMANCE HETEROCYCLE OLIGOMERS AND BLENDS

Hyman R. Lubowitz, Rolling Hills Estates, Calif., and Clyde H. Sheppard, Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

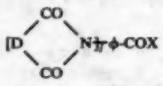
Continuation-in-part of Ser. No. 816,490, Jan. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 651,826, Sep. 18, 1984, abandoned. This application Nov. 3, 1987, Ser. No. 116,592

Int. Cl.[5] **C08G** *69/44, 63/02*

U.S. Cl. 528—170 **27 Claims**

1. A crosslinkable oligomer formed by reacting:

(a) 2 moles of a crosslinking phenylimide acid halide of the general formula:



wherein

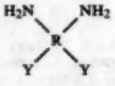
D=an unsaturated hydrocarbon radical;

i=1 or 2: and

ϕ=phenyl

(b) n moles of a diacid halide; and

(c) n+1 moles of at least one four-functional compound of the general formula:



wherein R is a hydrocarbon radial, Y is selected from the group consisting of —OH, —SH and —NH_2, each Y group is attached to a carbon atom adjacent to a carbon atom to which the —NH_2 group is attached, and n is selected so that the oligomer has an average formula weight of between about 500 to about 40,000.

4,965,337

VERY HIGH HEAT THERMOPLASTIC POLYETHERIMIDES CONTAINING AROMATIC STRUCTURE

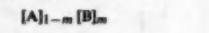
Edward N. Peters, Lenox; Dana Bookbinder, Pittsfield, both of Mass., and James A. Cella, Clifton Park, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 140,223, Dec. 31, 1987, abandoned. This application Jan. 30, 1989, Ser. No. 303,988

Int. Cl.[5] **C08G** *69/26, 8/02*

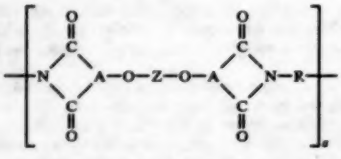
U.S. Cl. 528—353 **9 Claims**

1. A polyetherimide consisting essentially of a polyetherimide of the formula:



I

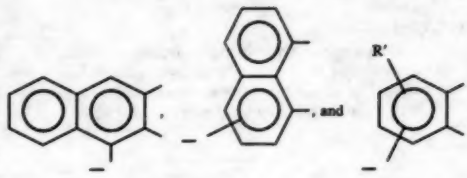
where m is a number from 0 to 0.50, where A units are of the formula:



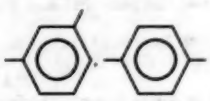
II

where the group

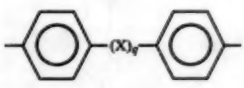
is selected from



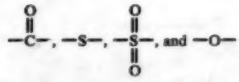
R′ being hydrogen; and the divalent bonds of the —O—Z—O— radical are in the 3,3′; 3,4′; 4,3′ or 4,4′ position; Z is a member of the class consisting of (1):



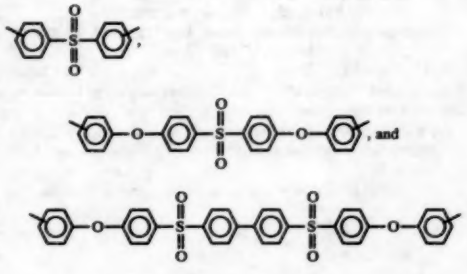
and (2) divalent organic radicals of the general formula:



where X is a member selected from the class consisting of divalent radials of the formulas:

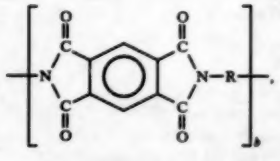


where q is O or 1 and R is a divalent organic radical selected from the class consisting of



and where the B units are of the formulas:

III



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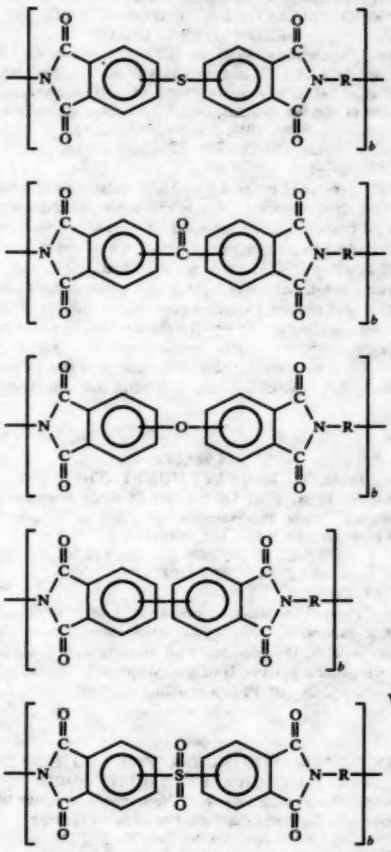


or mixtures thereof, where R is a divalent organic radical as previously defined, and independently a and b represent a whole number in excess of 1.

4,965,338

PBT WITH IMPROVED TRACKING RESISTANCE

Farshid M. H. Tabankia, Brasschaat, Belgium, and Jan de Boer, Bergen op Zoom, Netherlands, assignors to General Electric Company, Pittsfield, Mass.

Filed Aug. 9, 1989, Ser. No. 391,005

Claims priority, application Netherlands, Aug. 18, 1988, 8802046

Int. Cl.[5] C08G 63/02

U.S. Cl. 528—272 20 Claims

1. Use of an alkane sulphonate salt, with more than eight carbon atoms in the alkane group, in polymer mixtures comprising a polyester having units derived from an alkanediol and an aromatic dicarboxylic acid, characterized in that the alkane sulphonate salt is used in a quantity of 1–10 parts by weight per 100 parts by weight of the polyester to improve the tracking index of the polymer mixture.

4,965,339

METHOD OF PREPARING SOLUBLE AROMATIC POLYIMIDES AND VARNISH COMPOSITIONS USING SAME

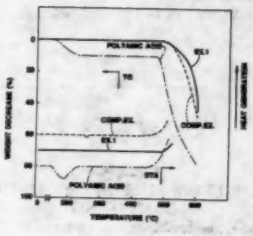
Yutaka Maruyama; Haruhiko Komoriya, both of Kamifukuoka, and Kentaro Tsutsumi, Kawagoe, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Aug. 8, 1989, Ser. No. 390,887

Claims priority, application Japan, Aug. 16, 1988, 63-203530

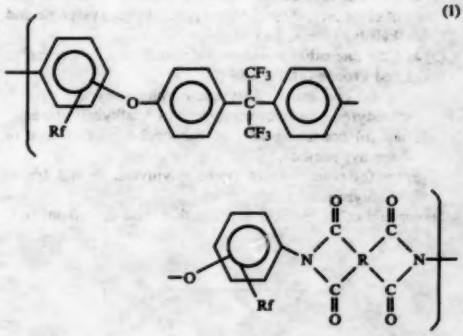
Int. Cl.[5] C08G 8/02, 69/26

U.S. Cl. 528—353 12 Claims



1. A method of preparing an aromatic polyimide soluble in organic solvents, the polyimide having a repeating unit represented by the general formula (1),

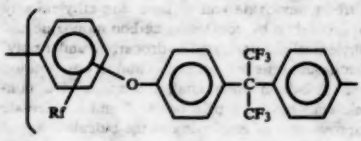
(1)



wherein Rf is a perfluoroalkyl group, R is a tetravalent organic group, and each —N= is at the meta- or para-position with respect to the aromatic ether bond —O—,

the method comprising subjecting an aromatic polyamic acid having a repeating unit represented by the general formula (2) to cyclization reaction in an organic solvent in the presence of an aliphatic monocarboxylic acid anhydride having not more than 6 carbon atoms and a tertiary amine,

(2)



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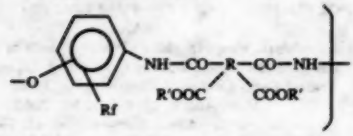


wherein Rf and R are as defined above with respect to the general formula (1), R' is hydrogen atom or a monovalent organic group, and each —NH— is at the meta- or para-position with respect to the aromatic ether bond —O—.

4,965,340

COPOLYMER FROM SULFUR DIOXIDE AND VINYL COMPOUND

Minoru Matsuda, Sendaishi, Japan, assignor to Chisso Corporation, Osaka, Japan

Continuation of Ser. No. 59,927, Jun. 9, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 297,487

Int. Cl.[5] C08G 75/00

U.S. Cl. 528—382 8 Claims

1. A copolymer from three or more monomers and having a number average molecular weight of 500 to 500,000 consisting of 1 to 50% by mol units of —SO—$_2$— units and 50 to 99% by mol units of

(1) at least one first member selected from the group consisting of chlorostyrene, acetoxystyrene, hydroxystyrene and trialkylsilylstyrene, and

(2) at least one other member selected from the hereinafter defined groups (a), (b) and (c),

group (a) consisting of styrene or chlorostyrene or acetoxystyrene, or hydroxystyrene or trialkylsilylstyrene,

group (b) consisting of 1-butene or 2-methyl-butene or 2-methyl-pentene,

group (c) consisting of trimethylvinylsilane and trimethylallylsilane

wherein said other member is other than said first member.

4,965,341

POLYMERIZATION OF CO/OLEFIN WITH CATALYST COMPRISING SULFUR BIDENTATE LIGAND

Johannes A. Van Doorn, and Eit Drent, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 15, 1989, Ser. No. 352,235

Claims priority, application Netherlands, Jun. 8, 1988, 8801472

Int. Cl.[5] C08G 67/02

U.S. Cl. 528—392 13 Claims

1. In the process for the production of linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon by contacting carbon monoxide and at least one ethylenically unsaturated hydrocarbon under polymerization conditions in the presence of a catalyst composition formed from a palladium compound, the anion of a non-hydrohalogenic acid having a pKa below 2 and a bidentate ligand, the improvement of employing as the bidentate ligand a bidentate ligand of sulfur.

4,965,342

HIGH MOLECULAR WEIGHT POLYMERS AND COPOLYMERS OF 3-HYDROXYOXETANE AND DERIVATIVES THEREOF

Edwin J. Vandenberg, Fountain Hills, and Jeffrey C. Mullis, Tempe, both of Ariz., assignors to Arizona Board of Regents, acting on behalf of Arizona State University, Tempe, Ariz.

Division of Ser. No. 203,262, Jun. 3, 1988. This application Oct. 10, 1989, Ser. No. 419,262

Int. Cl.[5] C08G 65/22, 65/32, 65/18

U.S. Cl. 528—417 2 Claims

1. The process of preparing high molecular weight branched poly(3-hydroxyoxetane) polymer comprising introducing into a sealed reactor vessel containing an inert atmosphere, a dry linear poly(3-hydroxyoxetane) having an inherent viscosity (0.1% in water at 30° C.) greater than 0.5, adding to said vessel a solvent and dispersion of NaH in an inert carrier; stirring the mixture until the poly(3-hydroxyoxetane) is thoroughly mixed therewith, adding glycidol to the stirred mixture and continue stirring until the reaction is complete and the branched polymer is formed; dialyzing said branched polymer to remove water solubles therefrom, and collecting the branched polymer.

4,965,343

METHOD OF PEPTIDE SYNTHESIS

Arthur M. Felix, West Caldwell, N.J.; Alain Fournier, Pierrefonds, Canada, and Waleed Danho, Wayne, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 28, 1988, Ser. No. 149,261

Int. Cl.[5] C07K 1/02, 1/04, 7/06

U.S. Cl. 530—334 19 Claims

1. A method for the solid phase synthesis of multi-sulfated peptides comprising coupling side-chain unprotected hydroxy-amino acids to the peptide chain utilizing benzotriazol-1-yl-oxy-tris-(dimethy)-oxy-tris-(dimethyl)-phosphonium hexa-fluorophosphate (BOP) as a coupling reagent.

4,965,344

PROCESS FOR OBTAINING ACTIVE PROTEINS FROM A BIOLOGICALLY INACTIVE FORM

Reinhard Hermann, Zoetermeer, Netherlands, assignor to Behringwerke Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 2, 1987, Ser. No. 56,721

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1986, 3618817

Int. Cl.[5] C07K 3/20, 3/12, 15/26

U.S. Cl. 530—351 15 Claims

1. A process for converting proteins to an active conformation from a biologically inactive conformation comprising:

treating a protein with a denaturant that solubilizes the protein and converts the protein into a denatured, random coil biologically inactive conformation;

applying the denatured protein and the denaturant solution to a sieve material having molecular sieve properties, said sieve material having an internal volume including pore means and an external surface area outside the internal volume, said pore means being dimensioned such that protein molecules are prevented from penetrating into the internal volume and such that the denaturant can enter the internal volume, said sieve material being preequilibrated with an appropriate renaturation buffer and said renaturation buffer being removed from the external surface are by mechanical force prior to the application of the denatured protein and the denaturant; and

applying a force exceeding the force of gravity to the denatured protein and the denaturant solution such that the solution passes through the sieve material without the protein entering the pore means of the sieve material, thereby substantially replacing the denaturant solution with the renaturation buffer, and thereby forcing the

protein and renaturation buffer out of the sieve material to obtain protein in an active conformation.

4,965,345

SOLVENT AZO DYES HAVING CARBOXYLIC ACID FUNCTIONS

Hermann Loeffler, Speyer, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

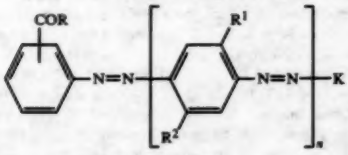
Filed Oct. 2, 1987, Ser. No. 103,692

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1986, 3634393

Int. Cl.[3] C09B *29/01, 29/40, 31/053, 31/068*

U.S. Cl. 534—651 **7 Claims**

1. A solvent dye of the formula:



wherein

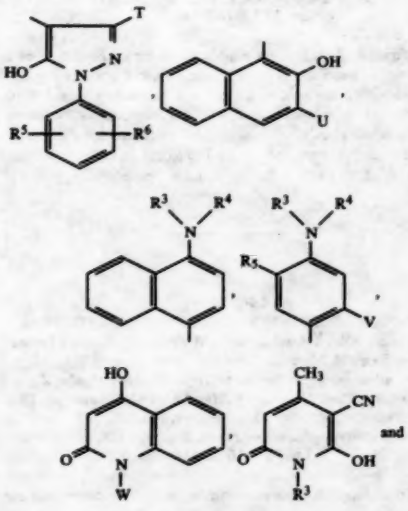
R is NR^3R^4 or OR^3;

R^1 and R^2 are identical or different and each is, independently of the other, hydrogen, methyl, ethyl, methoxy or ethoxy;

n is 1;

R^3 and R^4 are identical or different and each is, independently of the other, C_1–C_{22}-alkyl, C_1–C_{22} alkyl substituted by halogen, pyrrolidino, piperidino or morpholino, or C_1–C_{22}-alkyl interrupted by oxygen, imino or C_1–C_4-alkylimino, subject to the proviso that COR has more than 8 carbon atoms; and

K is a radical of a coupling component of one of the formulae:



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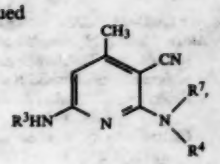


wherein:

T is $CONHR^3$ or $COOR^4$;

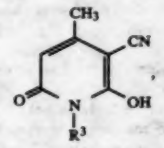
U is hydrogen or COR;

V is hydrogen, methyl, methoxy, NHCOW or NHCOOW,

W is C_1–C_4-alkyl;

R^5 and R^6 are identical or different and each is, independently of the other, hydrogen, methyl, methoxy, chlorine or bromine;

R^7 is hydrogen or R^3; and when K is



at least one of R^3 and R^4 is C_{10}–C_{22}-alkyl.

4,965,346

HETEROCYCLIC AZO DYES CONTAINING CYANOTHIOPHENE DERIVATIVES AS DIAZO COMPONENTS AND DIAMINOPYRIDINES AS COUPLING COMPONENTS

Johannes Dehnert, Ludwigshafen; Gunther Lamm, Hassloch, and Hermann Loeffler, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

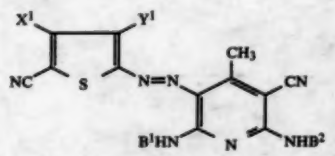
Division of Ser. No. 188,075, Apr. 28, 1988, Pat. No. 4,855,413, which is a continuation of Ser. No. 888956, Jul. 24, 1986, abandoned. This application Mar. 16, 1989, Ser. No. 324,558

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1985, 3528759

Int. Cl.[3] C09B *29/42, 29/033;* **D06P** *1/18, 3/54*

U.S. Cl. 534—766 **6 Claims**

1. A compound of formula I



where X_1 is hydrogen or methyl; Y_1 is $COOCH_3$, $COOC_2H_5$, $COOC_3H_7$, $COOC_4H_9$ or $COOC_2H_4OCH_3$ and

B^1 and B^2 independently of one another are each hydrogen or

(i) C_2–C_8-alkyl which is unsubstituted;

(ii) C_2–C_8-alkyl which is substituted by hydroxyl, C_1–C_8-alkanoyloxy, C_1–C_4-alkoxy, benzyloxy, or phenoxy;

(iii) C_2–C_8-alkyl which is interrupted by oxygen, exclusive of (ii); or

(iv) C_2–C_8-alkyl which is interrupted by oxygen and substituted by hydroxy, C_1–C_8-alkanoyloxy, C_1–C_4-alkoxy, benzyloxy or phenoxy, exclusive of (ii) and (iii).

4,965,347

BETA-D-GLUCAN, AND ITS PRODUCTION AND USES

Akira Misaki, Hyogo; Yoshiaki Sone, Osaka; Masakazu Mitsuhashi, and Toshio Miyake, both of Okayama, all of Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Feb. 25, 1987, Ser. No. 19,186
Claims priority, application Japan, Mar. 3, 1986, 61-44189
Int. Cl.[5] C07G *3/00*; C08B *37/00*; A61K *31/70*, *31/705*
U.S. Cl. 536—1.1 3 Claims

1. A beta D-glucan which has the following physiocochemical properties:

(a) Element analysis;

C = 44.1% H = 6.18%
N < 0.1% Ash < 0.01%

(b) Molecular weight (by gel filtration); 100,000 to 500,000 daltons

(c) Melting point; decomposable at about 20° C.

(d) Specific rotation $[\alpha]_D^{25}$; ± degrees (l=1, c=1.0%, 1 N NaOH)

(e) Infrared spectrum (by the KBr tablet method); as illustrated in FIG. 1

(f) Solubility; readily soluble in both 0.5 N NaOH and dimethyl sulfoxide; soluble in water; and insoluble in methanol, ethanol, acetone and chloroform

(g) Color reaction;
anthrone-sulfuric acid reaction: positive
phenol-sulfuric acid reaction: positive
carbazole reaction: negative
ninhydrin reaction: negative
iodine reaction: negative

(h) Properties in aqueous solution; 0.1% aqueous solution of a lyophilized preparation is neutral or slightly acidic

(i) Appearance; white power;

and wherein, upon methylation analysis, said beta-D-glucan gives the molecular ratios of 11 to 15 for 2,4,6-tri-O-methyl-D-glucose; 0.8 to 1.2 for 2,3,4-tri-O-methyl-D-glucose, 0.6 to 1.0 to 2,3,6-tri-O-methyl-D-glucose; and 0.8 to 1.2 for 2,4-di-O-methyl-D-glucose against 1.0 mole of 2,3,4,6-tetra-O-methyl-D-glucosse; or, 3 to 5 for 2,4,6-tri-O-methyl-D-glucose; 0.3 to 0.5 for 2,3,4-tri-O-methyl-D-glucose; 0.2 to 0.4 for 2,3,6-tri-O-methyl-D-glucose; and 0.9 to 1.2 for 2,4,-di-O-methyl-D-glucose against 1.0 mole of 2,3,4,6-tetra-O-methyl-D-glucose.

4,965,348

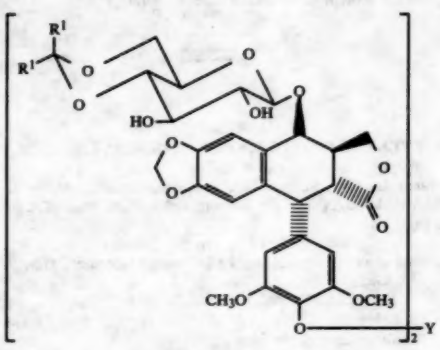
DIMERIC EPIPODOPHYLLOTOXIN GLUCOSIDE DERIVATIVES

Mark G. Saulnier, Middletown, and David R. Langley, Meriden, both of Conn., assignors to Bristol-Myers Company, New York, N.Y.

Filed May 19, 1989, Ser. No. 354,956
Int. Cl.[5] C07H *15/24*, *15/20*, *15/26*
U.S. Cl. 536—17.2 10 Claims

1. A compound having the formula

IV



wherein R^1 and R^2 are each C_{1-10}alkyl; or R^1 and R^2 together with the carbon to which they are attached represent C_{5-6} cycloalkyl; or R^1 is H and R^2 is selected from the group consisting of C_{1-10}alkyl, C_{2-10}alkenyl, C_{3-6}cycloalkyl, furyl, thienyl, C_{6-10}aryl, and C_{7-14}aralkyl; and Y is —C(O)— or —C(O)—a—X—a—C(O)—, wherein a—X—a is selected from the group consisting of (C_{1-10})alkylene and (C_{2-3})alkylenediamine; or X is selected from the group consisting of C_{3-6}cycloalkyl, C_{6-12}aryl, 5- to 6-membered heteroaryl, and 5- to 6-membered nitrogen containing aliphatic ring; and a is selected from the group consisting of (C_{1-5})alkylene and amino(C_{1-5})alkylene.

4,965,349

METHOD OF SYNTHESIZING OLIGONUCLEOTIDES LABELED WITH AMMONIA-LABILE GROUPS ON SOLID PHASE SUPPORTS

Sam L. Woo, Redwood City; Steven M. Meachen, Fremont, and Steven Fung, Palo Alto, all of Calif., assignors to Applied Biosystems, Inc., Foster City, Calif.

Filed Dec. 24, 1987, Ser. No. 138,287
Int. Cl.[5] C07H *19/00*
U.S. Cl. 536—27 11 Claims

1. A process of cleaving a base-labile linking group between an oligonucleotide and a solid phase support comprising the step of exposing the linking group to a cleavage reagent until the linking group is hydrolyzed, the cleavage reagent comprising a lower alkyl alcohol, water, and a non-nucleophilic hindered alkylamine containing from 3 to 6 carbon atoms in a ratio of about 1:1:1 to about 1:3:1 by volume, respectively.

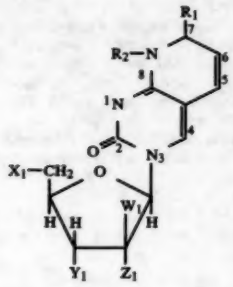
4,965,350

PYRIDOPYRIMIDINE NUCLEOTIDE COMPOUNDS

Hideo Inoue; Eiko Ohtsuka, both of Sapporo; Akihiro Imura, Tokyo; Kenichi Masuda, Hachioji, and Takashi Kaminuma, Tokyo, all of Japan, assignors to Teijin Limited, Osaka, Japan

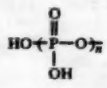
Continuation of Ser. No. 54,910, May 11, 1987, abandoned. This application May 11, 1989, Ser. No. 351,317
Claims priority, application Japan, Sep. 9, 1985, 60-197689
Int. Cl.[5] A61K *31/70*
U.S. Cl. 536—28 4 Claims

1. A pyridopyrimidine nucleotide derivative expressed by formula (I):

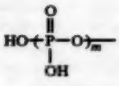


(I)

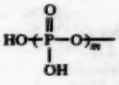
wherein X_1 and Y_1 each represent



(wherein n is an integer of 0, 1, 2, or 3, provided that n is not 0 for both X_1 and Y_1);
wherein Z_1 represents a hydrogen atom or



(wherein m is an integer of 0, 1, 2, or 3);
wherein W_1 represents a hydrogen atom or a hydroxyl group, provided that Z_1 is not



when W_1 represents a hydroxyl group; and
wherein R_1 represents an amino group or halogen atom and R_2 represents a single bond between the carbon atom at the 7-position and the nitrogen atom at the 8-position or R_1 represents a carbonyl bond

formed with the carbon atom at the 7-position and R_2 represents a lower alkyl group.

4,965,351

4-DEMETHOXY-4-AMINO-ANTHRACYCLINES

Michele Caruso; Antonino Suarato; Francesco Angelucci, and Federico Arcamone, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.R.L., Milan, Italy

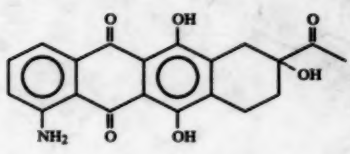
Division of Ser. No. 181,506, Apr. 14, 1988, abandoned. This application Nov. 1, 1989, Ser. No. 430,149

Claims priority, application United Kingdom, Apr. 21, 1987, 8709353; Feb. 12, 1988, 8803302

Int. Cl.[5] C07H *15/24*; A01N *43/04*

U.S. Cl. 536—6.4 **12 Claims**

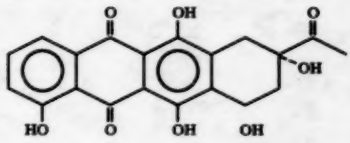
3. A process for the preparation of a daunomycinone of formula (IX)



(IX)

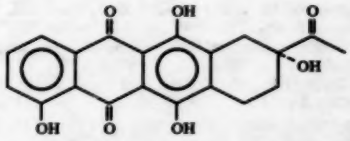
comprising the steps of:

(a) removing by hydrogenolysis, the 7α-hydroxyl group of a carminomycinone of formula (V)



(V)

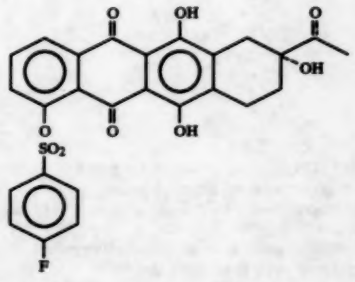
(b) reacting the resulting 4-demethyl-7-deoxy-daunomycinone of formula (VI)



(VI)

with a 4-fluorobenzenesulfonyl chloride in the presence of N,N-diisopropylethylamine and a catalytic amount of 4-dimethylaminopyridine,

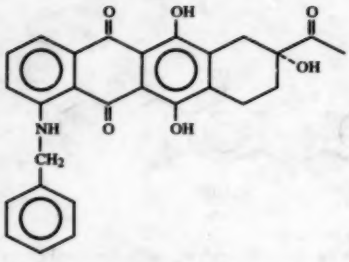
(c) reacting the resulting 4-demethoxy-4-O-[4-fluorobenzenesulfonyl]-7-deoxy-daunomycinone of formula (VII)



VII

with benzylamine,

(d) removing the benzyl group from the resulting 4-demethoxy-4-benzylamino-7-deoxy-daunomycinone of formula (VIII)



VIII

by catalytic hydrogenation.

4,965,352

ANTHRACYCLINE DERIVATIVES HAVING CYTOSTATIC ACTIVITY

Cenek Kolar, Marburg; Michael Paal, Hamburg; Peter Hermentin, and Hans P. Kraemer, both of Marburg, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg/Lahn, Fed. Rep. of Germany

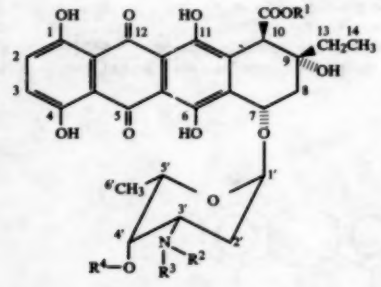
Continuation of Ser. No. 128,785, Dec. 4, 1987, abandoned. This application Jun. 12, 1989, Ser. No. 364,530

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1986, 3641835

Int. Cl.[5] G07H *15/00*

U.S. Cl. 536—6.4 31 Claims

1. An anthracycline having cytostatic activity and the formula I:



I

wherein

R^1 is a $CH_3(CH_2)_n$ group in which n is 0 to 3,

R^2 is a hydrogen atom or a methyl group,

R^3 is a hydrogen atom, a methyl group or an acyl protective group, and

R^4 is a hydrogen atom or an acyl protective group,

or an inorganic or organic acid salt thereof.

30. A unit dosage pharmaceutical composition for treating cancer, which comprises an effective amount of an anthracycline of claim 1 or a pharmaceutically acceptable salt thereof effective for said treatment in combination with a pharmaceutically acceptable carrier.

4,965,353

POLYSACCHARIDE ESTERS AND THEIR SALTS

Francesco della Valle, Padova, and Aurelio Romeo, Rome, both of Italy, assignors to Fidia S.p.A., Abano Terme, Italy

Division of Ser. No. 881,454, Jul. 2, 1986, Pat. No. 4,851,521. This application Apr. 19, 1989, Ser. No. 339,919

Claims priority, application Italy, Jul. 8, 1985, 48322 A85; Jun. 30, 1986, 48202 A86

The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.

Int. Cl.[5] A61K *31/70*; C07H *1/00*; C07G *3/00*

U.S. Cl. 536—55.1 43 Claims

1. A total ester of hyaluronic acid selected from the group consisting of the total benzyl ester, the total n-propyl ester and the total ethyl ester.

4,965,354

PROCESS FOR PRODUCING A CONDENSED POLYSACCHARIDE

Toshio Yanaki; Shigeki Maehata, both of Kobe; Tomoko Satoh, Sakai, and Shinji Ikeda, Kobe, all of Japan, assignors to Taito Company, Ltd., Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 161,170

Int. Cl.[5] C07H *1/00*; C08B *37/00, 1/00*; A23L *1/00*; A61K *31/00*

U.S. Cl. 536—124 6 Claims

1. A process for producing a condensed polysaccharide which comprises heat-melting a mixture consisting essentially of a material which liberates hydrogen chloride in a concentration from 8 to 180 ppm and at least one compound selected from the group consisting of glucose, mannose, galactose, xylose and arabinose followed by dehydration condensation under reduced pressure.

4,965,355

PROCESS FOR THE PREPARTION OF CEFATRIZINE 1,2-PROPYLENE GLYCOLATE

Luigi Ratti, Bergamo, and Leone Dall'Asta, Pavia, both of Italy, assignors to Biochimica OPOS SpA, Milan, Italy

Filed Feb. 23, 1989, Ser. No. 314,025

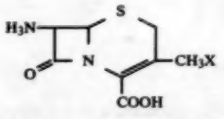
Claims priority, application Italy, Feb. 24, 1988, 19513 A/88

Int. Cl.[5] C07D *501/04*

U.S. Cl. 540—226 5 Claims

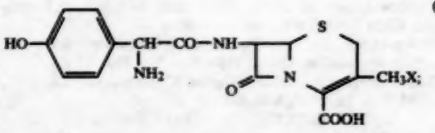
1. A process for the preparation of cefatrizine 1,2-propylene glycolate which comprises:

(a) reacting a 7-amino-3-halomethyl-3-cephem-4-carboxylic acid of the formula



(II)

wherein X is chlorine or iodine, with D(−)-p-hydroxyphenylglychylchloride hydrochloride to form a 7-[D(−)-α-amino-α-(p-hydroxyphenyl)acetamido]-3-halomethyl-3-cephem-4-carboxylic acid of the formula



(IV)

(b) when X is chlorine, reacting the chloro compound with a iodine donor compound to form 7-[D(−)-α-amino-α-(p-

hydroxyphenyl)acetamido]-3-iodomethyl-3-cephem-4-carboxylic acid;

(c) reacting 7-[D(−)-α-amino-α-(p-hydroxyphenyl-)acetamido]-3-iodomethyl-3-cephem-4-carboxylic acid with the sodium salt of 1,2,3-triazol-4(5)-thiol in 1,2-propylene glycol; and

(d) adding water to the reaction mixture in the previous step and recovering the cefatrizine 1,2-propylene glycolate which precipitates.

4,965,356

RESOLUTION PROCESS FOR BENZAZEPINE INTERMEDIATES

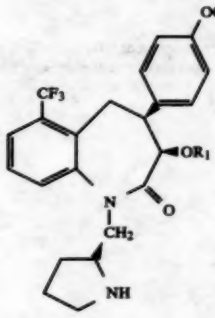
John K. Thottathil, Robbinsville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 275,493, Nov. 23, 1988, Pat. No. 4,885,364. This application Oct. 30, 1989, Ser. No. 429,238

Int. Cl.[5] C07D *223/16*

U.S. Cl. 540—523 **14 Claims**

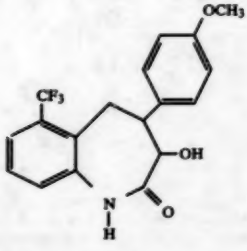
1. A method for preparing benzazepine compounds of the formula



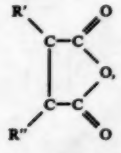
VII'

wherein R_1 is hydrogen, or acetyl, comprising the steps of:

(a) treating a racemic (mixture of the cis(+) and cis(−) enantiomers) compound of the formula

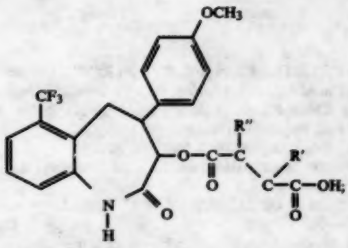


with an anhydride of the formula



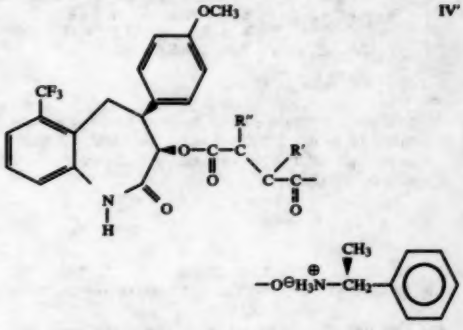
II

wherein R' and R'' are each hydrogen or taken together with the carbons to which they are attached form a benzene ring which may be substituted with nitro or 1, 2, 3 or 4 halogens, to provide a racemic intermediate of the formula



III'

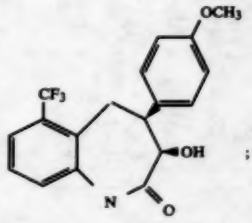
(b) treating a compound of formula III', in a solvent with a resolving agent, to provide a mixture of diasteromeric salts from which a compound of the formula



IV'

is crystallized;

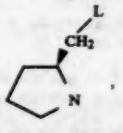
(c) treating the compounds of formula IV' with a base, in the presence of solvents, to provide the resolved cis(+) enantiomers of the formula



I'

and,

(d) coupling the compound of formula I' with a compound of the formula



VIII

where L is a leaving group, to provide the compounds of formula VII' where R_1 is hydrogen, and acylating the so-formed compound of formula VII' where R_1 is hydro-

gen to provide the compound of formula VII' where R_1 is acetyl.

4,965,357

2,5,6-SUBSTITUTED N_1-ALKYLPYRIMIDINES

Henrich H. Paradies, Iserlohn, Fed. Rep. of Germany, assignor to Medice Chem.-Pharm. Fabrik Putter GmbH & Co. KG, Iserlohn, Fed. Rep. of Germany

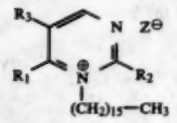
Filed Aug. 6, 1987, Ser. No. 82,899

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1986, 3626700

Int. Cl.[5] C07D *239/30, 239/47, 239/52*

U.S. Cl. 544—309 **1 Claim**

1. 2,5,6-Substituted N_1-hexadecylpyrimidinium compounds of the formula



$R_1 = R_2 = R_3 = H$
$R_1 = NH_2$; $R_2 = OH$; $R_3 = H$
$R_1 = OH$; $R_2 = OH$; $R_3 = CH_3$
$R_1 = OH$; $R_2 = OH$; $R_3 = H$
$R_1 = F$; $R_2 = OH$; $R_3 = H$
$R_1 = OH$; $R_2 = OH$; $R_3 = F$

wherein

$Z^{\ominus}$=chloride, bromide, iodide, maleate, formate, acetate, propionate, hydrogen sulfate, malate fumarate, salicylate, alginate, gluconate, glucoronate, galactoronate, ethyl sulfate or $H_2PO_4^-$.

4,965,358

N,N'-CARBONYL-BIS-(4-ETHYL-2,3-DIOXO)-PIPERAZINE

Juan Cabré Castellví, Barcelona; José Diago Meseguer, Granollers; Asunción Esteve Bianchini, Barcelona; Carlos E. Lenhardt Padró, Alella, and Esteve Sans Pitarch, Barcelona, all of Spain, assignors to Gema, S. A., Barcelona, Spain

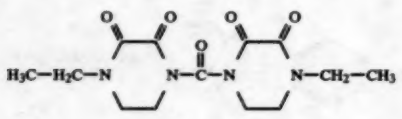
Filed Nov. 10, 1988, Ser. No. 269,916

Claims priority, application Spain, Nov. 16, 1987, 8703260

Int. Cl.[5] C07D *403/02*

U.S. Cl. 544—357 **1 Claim**

1. N,N'-carbonyl-bis-(4-ethyl-2,3-dioxo)-piperazine of Formula I



(I)

4,965,359

PROCESS FOR THE PRODUCTION OF 4,5,6,7-TETRAHYDROTHIENO-[3,2-C]-PYRIDINES

Jacques Gosteli, Basel, and Aleksander Warm, Visp, both of Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

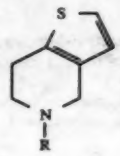
Filed Sep. 20, 1989, Ser. No. 409,743

Claims priority, application Switzerland, Sep. 23, 1988, 3539/88

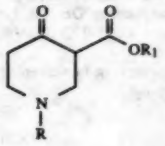
Int. Cl.[5] C07D *471/02*

U.S. Cl. 546—114 **10 Claims**

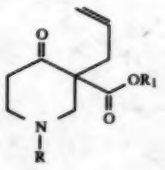
1. Process for the production of 4,5,6,7-tetrahydrothieno-[3,2-c]-pyridines of the formula:



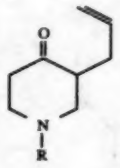
wherein R is hydrogen, a formyl group, an acetyl group or a benzoyl group or is a benzyl group, whose aromatic ring optionally is ring-substituted by at least one halogen atom, characterized in that a 4-oxo-piperidine-3-carboxylic acid ester of the formula:



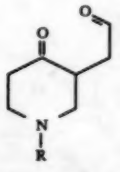
wherein R has the above meaning and R_1 is an alkyl group with 1 to 4 C atoms, with an allylhalide in the presence of a base is converted to a 4-oxo-3-(2-propenyl)-piperidine-3-carboxylic acid ester of the formula:



wherein R and R_1 have the above-mentioned meanings, is decarboxylated to 4-oxo-3-(2-propenyl)-piperidine of the formula:



wherein R has the above-mentioned meaning, is reacted in the presence of an acid with ozone and is converted with a reducing agent to the 4-oxo-3-piperidine acetaldehyde of the formula:



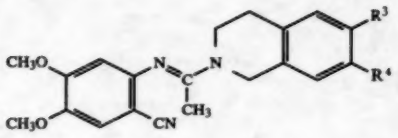
wherein R has the above-mentioned meaning, and finally with hydrogen chloride and hydrogen sulfide in the presence of a metal halide is cyclized to the end product.

4,965,360
TETRAHYDROISOQUINOLINE COMPOUNDS

Nigel J. Cussans, Sandwich, England, assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 232,345, Aug. 12, 1988, Pat. No. 4,882,337.
This application Aug. 23, 1989, Ser. No. 397,605
Claims priority, application United Kingdom, Aug. 15, 1987, 8719378
Int. Cl.[5] C07D *217/16*
U.S. Cl. 546—145 3 Claims

1. A compound of the formula:



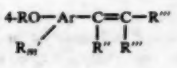
wherein one of R^3 and R^4 is methoxy and the other of R^3 and R^4 is hydroxy or benzyloxy.

4,965,361
PREPARATION OF 4-SUBSTITUTED ARYL OLEFINS

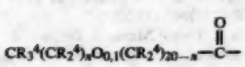
Kevin J. Edgar, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 27, 1989, Ser. No. 315,674
Int. Cl.[5] C07D *215/16, 213/127;* C07F *13/00*
U.S. Cl. 516—179 13 Claims

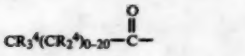
1. In a method for the preparation of unsaturated 4-oxyaryl compounds of the structure:



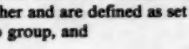
wherein R is selected from the group consisting of:
H,
C_1 up to C_{20} alkyl or substituted alkyl moieties, acyl moieties of the structure:



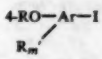
wherein each R^4 is independently selected from the group consisting of:
H,
alkyl and substituted alkyl moieties,
aryl and substituted aryl moieties,
halogens, and
wherein n is a whole number which falls in the range of 0 up to 20;
$R^5{}_3Si$—, wherein each R^5 is independently selected from alkyl moieties, substituted alkyl moieties, aryl moieties or substituted aryl moieties;
wherein each of R′ and R‴ are independently selected from
H,
C_1 up to C_{20} alkyl or substituted alkyl,
C_5 up to C_{14} aryl or substituted aryl,
acyl moieties of the structure:



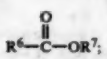
wherein each R^4 is selected independently from one another and are defined as set forth above, halides, a nitro group, and sulfones or sulfoxides having the structure:



wherein R^5 is as defined above;
wherein R″ is selected from the group consisting of:
H,
C_1 up to C_5 alkyl moieties;
wherein Ar is a C_5 up to C_{14} hydrocarbyl- or hetero-aromatic moiety; and
wherein m can vary from 0 up to 4;
said method comprising contacting an aryl iodide of the formula:



with a C_2 up to C_{20} olefin or substituted olefin in the presence of a Bronsted base and a palladium catalyst under conditions suitable for the formation of the desired unsaturated aryl compound; the improvement wherein said contacting is carried out in the presence of an ester solvent of the structure:



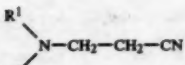
wherein each of R^6 and R^7 are selected independently from C_1 up to C_5 alkyl radicals, with the proviso that total number of carbon atoms contained by the R^6 plus the R^7 groups is no greater than 6.

4,965,362
JOINT PREPARATION OF 3-DIALKYLAMINOPROPIONITRILES, BIS-(2-CYANOETHYL) ETHER AND, IF DESIRED, ETHYLENE-CYANOHYDRIN

Franz Merger, 25 Max-Sievogt-Strasse, 6710 Frankenthal; Wolfgang Harder, 16 Bergwaldstrasse, 6940 Weinheim; Peter Hettinger, 4 Sievertstrasse, 6802 Ladenburg; Claus-Ulrich Priester, 18 Ungsteinaer Strasse; Dieter Franz, 75 Horst-Schork-Strasse, both of 6700 Ludwigshafen, and Dieter Voges, 113 Speyerer Strasse, 6800 Mannheim 1, all of Fed. Rep. of Germany

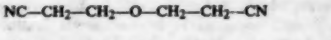
Filed Jul. 6, 1989, Ser. No. 376,373
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1988, 3825119
Int. Cl.[5] C07C *253/18;* C07D *295/145*
U.S. Cl. 546—246 8 Claims

1. A process for the joint preparation of
(1) an aminopropionitrile of the formula



I

where R^1 and R^2 are each C_1–C_4-alkyl or, when taken together, represent C_4–C_5-alkylene to form a 5-membered or 6-membered ring,
(2) bis-(2-cyanoethyl) ether



II, and

(3) ethylenecyanohydrin

III,

which process comprises:
(a) reacting acrylonitrile and water in the presence of a base at from 60° to 150° C. to give a first product mixture

containing acrylonitrile, water and said bis-(2-cyanoethyl) ether II, the base being selected from the group consisting of a mineral base, a quaternary nitrogen base, and mixtures thereof,

(b) reacting this first product mixture at about 0°–50° C. with a secondary amine of the formula

IV

wherein R^1 and R^2 have the same meaning as above, to give a second product mixture containing water, said aminopropionitrile I and said bis-(2-cyanoethyl) ether II; and

(c) reacting said ether II obtained in at least one of the process stages (a) and (b) at from 50° to 150° C. with said amine IV to give a third product mixture containing said aminopropionitrile I and said ethylenecyanohydrin III.

4,965,363

PROCESS FOR THE PREPARATION OF 3-CYANO-4-ARYL-PYRROLES

Detlef Wollweber, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

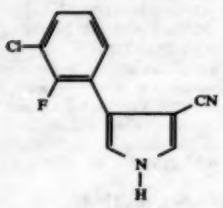
Filed Jan. 5, 1989, Ser. No. 293,720

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1988, 3800387

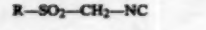
Int. Cl.[5] C07D *207/34, 401/04, 409/04, 405/04*

U.S. Cl. 548—561 **7 Claims**

1. A process for the preparation of 3-cyano-4-(2-fluoro-3-chlorophenyl)-pyrrole of the formula



comprising (a) reacting 2-(2-fluoro-3-chlorophenylmethylidene)cyanacetamide with a sulphonylmethylisocyanide of the formula



in which

R is alkyl, unsubstituted or substituted cycloalkyl or unsubstituted or substituted aryl,

in the presence of a base and in the presence of a diluent, and

(b) adjusting the pH to about 3 when the reaction is complete by adding hydrochloric acid.

4,965,364

LIGAND-ACCELERATED CATALYTIC ASYMMETRIC DIHYDROXYLATION

Istvan E. Marko, Sheffield, England, and K. Barry Sharpless, Brookline, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

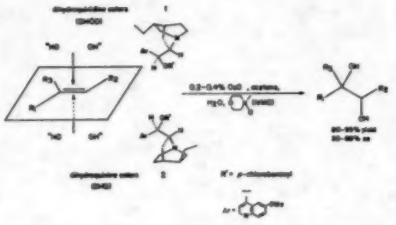
Continuation-in-part of Ser. No. 159,068, Feb. 23, 1988, which is a continuation-in-part of Ser. No. 142,692, Jan. 11, 1988, abandoned. This application Sep. 28, 1988, Ser. No. 250,378

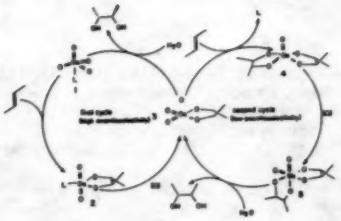
Int. Cl.[5] C07D *453/02, 453/04*; C07C *215/34, 33/26*

U.S. Cl. 546—134 **11 Claims**

5. An osmium-catalyzed, ligand-accelerated method for producing an asymmetrically dihydroxylated olefin, comprising:

a. combining (1) a dihydroquinine derivative or a dihydroquinidine derivative, (2) an organic solvent, (3) N-





methylmorpholine N-oxide, (4) a tetraalkyl ammonium compound, and (5) an osmium tetroxide catalyst; and

b. adding the olefin slowly to the combination formed in (a) under conditions appropriate for dihydroxylation of the olefin to occur.

4,965,365

IMIDAZOLE DERIVATIVES AND A PROCESS FOR THE PREPARATION THEREOF

Amparo S. Sanfeliu; Lucia S. Tuero; Maria J. Delgado de Molina González, all of Valencia, and Antonio B. Vinas, Barcelona, all of Spain, assignors to Laboratorios Vinas, S.A., Barcelona, Spain

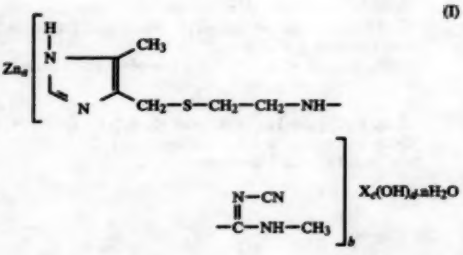
Filed May 23, 1989, Ser. No. 356,013

Claims priority, application Spain, May 26, 1988, 8801655

Int. Cl.[5] *C07F 3/06*

U.S. Cl. 548—109 **11 Claims**

1. An imidazole derivative corresponding to a compound of formula I,



(I)

where

X is an anion selected from the group consisting of chloride and acetate; a is 1, 2, 3, 4 or 5;

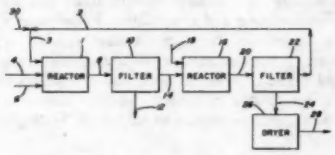
b is 1, 2, 3, 4, 5, 6 or 7; c is 1, 2, 3 or 4;
d is equal to (2a-c) and n is 0, 1, 2 or 3.

4,965,366

METHOD FOR PRODUCING 1-(TRISUBSTITUTED SILYL)AZOLES

Paul M. Novy, Roselle, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 7, 1984, Ser. No. 608,006
Int. Cl.[5] C07D *231/00*
U.S. Cl. 548—110 **21 Claims**



1. A method comprising reacting

(a) at least one 1-unsubstituted 1H-azole compound selected from 1-unsubstituted monocyclic 1H-diazole compounds, 1-unsubstituted bicyclic 1H-diazole compounds containing a fused benzene ring, 1-unsubstituted monocyclic 1H-triazole compounds, and 1-unsubstituted bicyclic 1H-triazole compounds containing a fused benzene ring,

(b) at least one substituted silane represented by the formula $R_1R_2R_3SiX$, and

(c) at least one primary amine wherein said primary amine is α,ω-diamino-n-alkane having from 2 to about 12 carbon atoms,

to form at least one 1-($R_1R_2R_3Si$) substituted 1H-azole compound which principally accumulates in a liquid phase and to form hydrohalide salt of said primary amine which principally accumulates in at least one phase which is different from said liquid phase, wherein R_1, R_2, and R_3 are each independently lower alkyl or phenyl and wherein X is fluoro, chloro, bromo, or iodo.

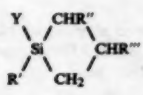
4,965,367

PROCESS FOR PREPARATION OF SILACYCLOBUTANES

Ronald H. Baney; Carl J. Bilgrien; Lawrence D. Fiedler, and Chi-long Lee, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

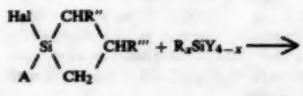
Filed Oct. 16, 1989, Ser. No. 422,207
Int. Cl.[5] C07F *7/08, 7/10*
U.S. Cl. 548—110 **7 Claims**

1. A process for preparing a silacyclobutane of the formula

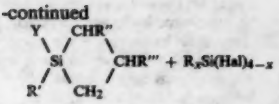


Y CHR'
Si CHR"
CH2

in accordance with the reaction



-continued



Hal CHR' Y CHR'
Si CHR', , R SiY Si CHR"
x 4-x
A CH2 R' CH2
RSi( )4-x

wherein A is a monovalent substituted or unsubstituted hydrocarbon radical, or halogen; Hal is a halogen; R is a monovalent substituted or unsubstituted hydrocarbon radical; R' is a monovalent substituted or unsubstituted hydrocarbon radical if A is a monovalent substituted or unsubstituted hydrocarbon radical; R' is a Y group if A is a halogen; R" and R''' are independently hydrogen, monovalent substituted or unsubstituted hydrocarbon radical; Y is a monovalent group having a nitrogen or oxygen atom which bonds to the silicon atom of the silacyclobutane; and x is an integer of from 0 through 3.

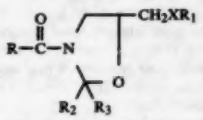
4,965,368

5-OXY OR THIOMETHYL SUBSTITUTED OXAZOLIDINE HERBICIDE ANTIDOTES

Eugene G. Teach, El Cerrito, Calif., assignor to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 564,980, Dec. 23, 1983, which is a division of Ser. No. 300,079, Sep. 8, 1981, abandoned, which is a continuation of Ser. No. 49,676, Jun. 18, 1979, abandoned. This application May 26, 1987, Ser. No. 53,881
Int. Cl.[5] C07D *263/02*
U.S. Cl. 548—215 **11 Claims**

1. A compound according to the formula



in which X is sulfur, R is haloalkyl, R_1 is alkyl and R_2 and R_3 are each lower alkyl.

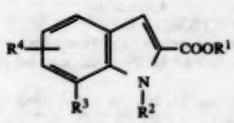
4,965,369

METHOD FOR PREPARING INDOLE CARBOXYLIC ACID DERIVATIVES

Uwe Maetzel, Burgdorf, and Walter Heitmann, Burgwedel, both of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

Filed Mar. 7, 1990, Ser. No. 489,895
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1989, 3907388
Int. Cl.[5] C07D *209/18, 471/06*
U.S. Cl. 548—492 **17 Claims**

1. A method of preparing an indole carboxylic acid compound corresponding to the Formula I,



wherein

R^1 represents hydrogen or lower alkyl,

R^2 represents lower alkyl or a carbocyclic aryl group or carbo-

cyclic aryl lower alkyl group which groups may optionally be substituted by lower alkyl, halogen or lower alkoxy, and

R^3 represents hydrogen, lower alkyl, lower alkoxy or a carbocyclic aryl group or carbocyclic aryl lower alkyl group which groups may optionally be substituted by lower alkyl, halogen or lower alkoxy, or

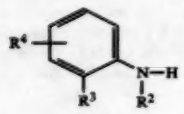
R^2 and R^3 together form an alkylene chain with 2 to 4 carbon atoms which may optionally be substituted by lower alkyl, and to which a 5-6-member carbocyclic ring may optionally be fused, or R^2 and R^3 together form an $—X—CH_2—CH_2—$ chain, wherein X is bonded to the phenyl ring of the indole structure and is oxygen or sulfur, and

R^4 represents hydrogen, lower alkyl, lower alkoxy, halogen or trifluoromethyl,

comprising the steps of:

(a) reacting an aniline compound corresponding to the Formula II,

(II)

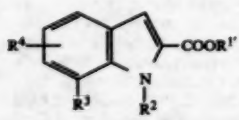


wherein R^2, R^3 and R^4 have the above meanings, with an alkali metal nitrite at temperatures in the range from about 0° to about 30° C. in an acidic medium containing an amount of acid at least equivalent to the compound of Formula II, to produce a corresponding nitrosamine derivative;

(b) while cooling to maintain the temperature in the range from about 0° to about 30° C., adding to the nitrosamine derivative-containing, acidic reaction medium from step (a), a quantity of metallic zinc which is at least twice molar relative to the compound of Formula II, and if needed to assure the presence of a sufficient quantity of acid adding additional acid, wherein the adding of at least one reactant selected from the group consisting of zinc and additional acid is carried out sufficiently slowly to prevent the temperature of the resulting reaction mixture from exceeding about 30° C., and allowing the resulting reaction mixture to react in the presence of a sufficient amount of acid and for a time sufficient to reduce the nitrosamine derivative to the corresponding hydrazine derivative, and

(c) reacting a hydrazine derivative containing reaction mixture obtained from step (b) with a pyruvic acid lower alkyl ester at temperatures in the range from about room temperature to about 120° C. to obtain an indole carboxylic acid ester derivative corresponding to Formula Ia,

(Ia)



wherein R^2 and R^3 have the above meanings and $R^{1'}$ is lower alkyl, and, if desired, subsequently hydrolyzing the indole carboxylic acid ester derivative to obtain the corresponding free acid.

4,965,370

N-METHYL-2-PYRROLIDONE PURIFICATION

Kenneth D. Goetz, and Bradley L. Munro, both of Bartlesville, Okla., assignors to Phillips Friedman Company, Bartlesville, Okla.

Filed Aug. 21, 1989, Ser. No. 396,208
Int. Cl.[5] C07D *201/14, 207/267*
U.S. Cl. 548—555 **29 Claims**

1. A process for recovery of N-methyl-2-pyrrolidone from an effluent stream in a poly(arylene sulfide) process wherein said effluent stream contains said N-methyl-2-pyrrolidone contaminated with acidic compounds and high boiling contaminants comprising:

(a) passing said effluent stream to a heavies fractionation zone and fractionating said effluent stream to produce a first overhead product stream containing N-methyl-2-pyrrolidone and a kettle liquid containing the remaining N-methyl-2-pyrrolidone, acidic compounds and high boiling contaminants,

(b) contacting said kettle liquid with an inorganic compound selected from the group consisting of alkaline earth oxides and alkaline earth hydroxides in an amount effective to reduce the acidic compound content of said kettle liquid, and

(c) introducing ihe thus treated kettle liquid into a thin-film evaporation zone and evaporating to produce a second overhead product stream containing N-methyl-2-pyrrolidone and a bottoms stream containing reaction products of said acidic compounds with said inorganic compound which are soluble in N-methyl-2-pyrrolidone, unreacted said acidic compounds, and said high boiling contaminants.

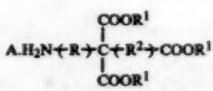
4,965,371

SELECTIVE CYCLIZATION PROCESS

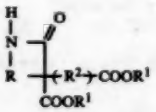
Gevork Minaskanian, Irvine, and James V. Peck, Costa Mesa, both of Calif., assignors to Whitby Research, Inc., Irvine, Calif.

Division of Ser. No. 847,464, Apr. 3, 1986, Pat. No. 4,870,170.
This application May 25, 1989, Ser. No. 357,027
Int. Cl.[5] C07D *205/08*
U.S. Cl. 548—952 **8 Claims**

1. A process for converting a first compound represented by the general formula:



selectively into a second compound represented by the general formula:



wherein R represents an alkylene or alkenylene radical containing 1 or 2 carbon atoms; R^2 is selected from radicals represented by the general formula:

$$—CR_2^4—_y$$

wherein R^4 is selected from the group consisting of hydrogen, alkyl radicals and phenyl and y is an integer of from 1 or 5; R^1 is an alkyl radical, having from one to eight carbon atoms, and A is an acid selected from the group consisting of carboxylic acids having between 1 and 10 carbon atoms, which process comprises the step neutralizing the acid with a substantially equivalent amount of a base and cyclizing said first compound at a temperature sufficient to cause cyclization to form at most a four-membered ring lactam.

4,965,372

PROCESS AND INTERMEDIATES FOR ISOPROPYL 3S-AMINO-2R-HYDROXY-ALKANOATES

Robert W. Dugger, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 299,863, Jan. 19, 1989, abandoned. This application Jun. 29, 1989, Ser. No. 374,200

Int. Cl.[5] C07D 307/20

U.S. Cl. 549—253 5 Claims

5. The compound of claim 2 wherein X and Y are taken together and R is cyclohexyl.

4,965,373

SUBSTITUTED GLUTARIC ACID LACTONES IN THE TREATMENT OF HYPERLIPIDEMIA

John S. Baran, Winnetka; Thomas J. Lindberg, Wheaton, and Harman S. Lowrie, Northbrook, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation of Ser. No. 896,493, Aug. 14, 1986, which is a continuation of Ser. No. 710,375, Mar. 11, 1985, Pat. No. 4,622,338. This application Nov. 7, 1988, Ser. No. 268,115

Int. Cl.[5] C07D 309/00, 407/00

U.S. Cl. 549—273 1 Claim

1. A method for the synthesis of the compound 3-carboxymethyl-3,5-dihydroxyoctadecanoic acid-1,5-lactone, comprising the steps of reacting 3-hydroxyhexadecanoic acid ethyl ester with allyl bromide and subsequently reacting the product thereof with trimethylsilylchloride.

4,965,374

PROCESS FOR AND INTERMEDIATES OF 2',2'-DIFLUORONUCLEOSIDES

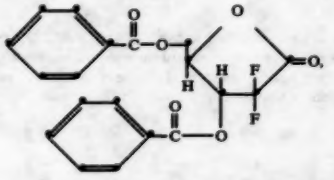
Ta-Sen Chou; Perry C. Heath, and Lawrence E. Patterson, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 236,058, Aug. 24, 1988, abandoned, which is a continuation-in-part of Ser. No. 90,725, Aug. 28, 1987, abandoned. This application Dec. 4, 1989, Ser. No. 445,139

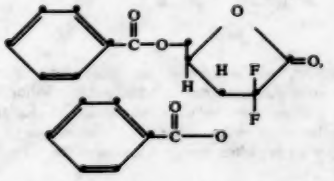
Int. Cl.[5] C07D 307/32

U.S. Cl. 549—313 4 Claims

1. A process for selectively isolating, in greater than about 95.0% purity, 2-deoxy-2,2-difluoro-D-erythro-pentofuranos-1-ulose-3,5-dibenzoate, which has the formula



from an enantiomeric mixture of erythro and threo lactones of the formula



comprising dissolving the enantiomeric mixture in methylene chloride, cooling the solution to a temperature in the range of about −5° C. to about 10° C., and collecting the precipitated erythro enantiomer.

4,965,375

THIO-BIS-(ALKYL LACTONE ACID ESTERS) AND THIO-BIS-(HYDROCARBYL DIACID ESTERS) ARE USEFUL ADDITIVES FOR LUBRICATING COMPOSITIONS

Stanley J. Brois, Westfield, and Antonio Gutierrez, Mercerville, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 184,627, Apr. 22, 1988, Pat. No. 4,866,187, which is a continuation of Ser. No. 804,306, Dec. 3, 1985, abandoned, which is a division of Ser. No. 528,213, Aug. 31, 1983, Pat. No. 4,568,756, which is a division of Ser. No. 273,299, Jul. 24, 1980, Pat. No. 4,417,062, which is a division of Ser. No. 954,051, Oct. 23, 1978, Pat. No. 4,239,636, which is a continuation-in-part of Ser. No. 768,265, Mar. 14, 1977, Pat. No. 4,123,373, and Ser. No. 806,326, Jun. 13, 1977, Pat. No. 4,167,514, which is a division of Ser. No. 726,206, Sep. 24, 1976, Pat. No. 4,062,786. This application Aug. 31, 1989, Ser. No. 401,399

Int. Cl.[5] C07D 407/12

U.S. Cl. 549—320 5 Claims

1. Thio-bis-(polyisobutyl lactone acid pentaerythritol ester).

4,965,376

3,9-DIHYDROXYNONYNE AND ITS DERIVATIVES PROTECTED AT THE 9-OH FUNCTION

Michael Huellmann, Heppenheim; Rainer Becker, Bad Durkheim; Gerald Lauterbach, Ludwigshafen; Ernst Buschmann, Ludwigshafen; Heinz Eckhardt, Ludwigshafen; Walter Himmele, Walldorf, and Christiane Brueckner, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

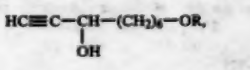
Filed Apr. 18, 1989, Ser. No. 340,035

Claims priority, application Fed. Rep. of Germany, May 4, 1988, 3815043

Int. Cl.[5] C07D 309/12; C07C 33/044

U.S. Cl. 549—423 2 Claims

1. 3,9-Dihydroxynonyne or its derivative protected at the 9-OH function, of the formula I



I

where R is hydrogen or a base-stable alcohol protective group.

4,965,377

PROCESS OF FORMING 2-(2-BROMO-2-NITROETHENYL)-FURAN

William F. McCoy, and Scott Thornburgh, both of West Lafayette, Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Division of Ser. No. 205,078, Jun. 10, 1988. This application Sep. 13, 1989, Ser. No. 406,711

Int. Cl.[5] C07D 307/38

U.S. Cl. 549—491 3 Claims

1. A process for synthesizing 2-(2-bromo-2-nitroethenyl)furan ("BNEF") containing no detectable trans-2-nitroethenylfuran for use as a broad spectrum antimicrobial agent by

a. contacting furfural with catalytic agent comprising a primary amine or its arunonium salt and a base in a polar solvent to form a reaction mixture;

b. adding bromonitromethane to the reaction mixture;

c. agitating the reaction mixture;

d. acidifying the reaction mixture;

e. stirring the acidified reaction mixture, and

f. removing the BNEF from the mixture.

4,965,378

VAPOR-PHASE HYDROGENATION OF MALEIC ANHYDRIDE TO TETRAHYDROFURAN AND GAMMA-BUTYROLACTONE

John R. Budge, Cleveland Heights, and Thomas G. Attig, Aurora, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 231,940, Aug. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 137,042, Dec. 23, 1987, abandoned. This application Jun. 23, 1989, Ser. No. 370,925

Int. Cl.[5] C07D *307/08*

U.S. Cl. 549—508 **13 Claims**

1. A continuous process for the preparation of tetrahydrofuran comprising catalytically hydrogenating a vaporous mixture consisting essentially of at least one of maleic anhydride or succinic anhydride in a hydrogen containing gas in contact with a hydrogenation catalyst, wherein the hydrogenation catalyst consists essentially of the formula:

$$Cu_iZn_bAl_cM_dO_x$$

wherein M is at least one element selected from the group consisting of

Groups IIA and IIIA, Group VA, Group VIII, Ag, Au, Groups IIIB thru VIIB, the Lanthanum Series, and Actinium Series,

$0.001 < b < 500$;

$0.001 < c < 500$;

$0 \leq d < 200$; and

x is the number of oxygen atoms necessary to satisfy the valency requirements of the other elements, and wherein the hydrogenation catalyst contains no metallic nickel.

4,965,379

FLUOROEPOXIDES AND A PROCESS FOR PRODUCTION THEREOF

Masanori Ikeda, Shizuoka; Morikazu Miura, and Atsushi Aoshima, both of Kanagawa, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 517,534, Jul. 26, 1983, abandoned, which is a continuation-in-part of Ser. No. 375,632, May 6, 1982, abandoned. This application Jul. 6, 1987, Ser. No. 69,745

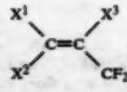
Claims priority, application Japan, Jul. 26, 1982, 57-129879; Dec. 15, 1982, 57-219469

The portion of the term of this patent subsequent to Feb. 20, 2007, has been disclaimed.

Int. Cl.[5] C07B *301/24*

U.S. Cl. 549—521 **23 Claims**

1. A process for producing a fluoroepoxide from a fluoroolefin represented by the general formula (I):



(I)

wherein X^1, X^2, and X^3 each is a substituent selected from the group consisting of (a) —F, (b) a perfluoroalkyl group having 2 different and is a substituent selected from the group consisting of (d) a halogen atom selected from the group consisting of F, Cl, Br and I, (e) $—OZ^1$ and (f) $—Z^1$, wherein Z^1 may be the same or different and is a substituted or unsubstituted hydrocarbon group having 20 or less carbon atoms; and X^1, X^2, X^3 and Y^1 may combine with one another to form a cyclic compound; provided that all of X^1, X^2, X^3 and Y^1 do not represent —F, by using hydrochloride as an oxidizing agent comprising:

epoxidizing the fluoro-olefin in a two-phase system of an aqueous phase and an organic phase which is immiscible in the aqueous phase, said hypochlorite being present in the aqueous phase, in the presence of an inorganic base, at a temperature of between −20° C. and 60° C., in the presence of a lipophilic quaternary ammonium salt catalyst, the total number of carbon atoms in quaternary ammonium ion being not less than 10 per quaternary ammonium ion, to produce a fluoroepoxide in the organic phase.

4,965,380

PROCESS FOR PREPARATION OF ASYMMETRIC TRIORGANOTIN HALIDE

Masazumi Fujikawa, Ibaraki, and Hideo Haneda, Kobe, both of Japan, assignors to Nitto Kasei Co., Ltd., Osaka, Japan

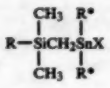
Filed Sep. 25, 1989, Ser. No. 412,322

Claims priority, application Japan, Sep. 28, 1988, 63-245269

Int. Cl.[5] C07F *7/08, 7/22*

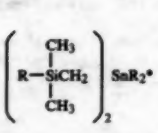
U.S. Cl. 556—12 **5 Claims**

1. A process for the preparation of an asymmetric triorganotin halide represented by the formula III



III

wherein R represent alkyl or phenyl, R* represents cyclohexyl or neophyl, and X represents a chlorine or bromine atom, which comprises reacting in the presence or absence of an inert organic solvent an asymmetric tetraorganotin compound of the formula I

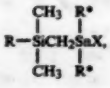


I

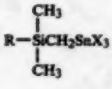
wherein R and R* are as defined above, with a tin (IV) halide of the formula II

$$SnX_4 \qquad \text{II}$$

wherein X is as defined above, in approximately equimolar amounts to yield a reaction mixture including an asymmetric triorganotin halide compound of the formula III and a monoorganotin trihalide compound of the formula IV



III



IV

wherein R, R* and X are as defined above, and subsequently, without isolating the asymmetric triorganotin halide III, reacting the reaction mixture with substantially twice the molar amount, based on monoorganotin trihalide IV, of an ether solution of an organomagnesium halide of the formula V

$$R^*MgX \qquad \text{V}$$

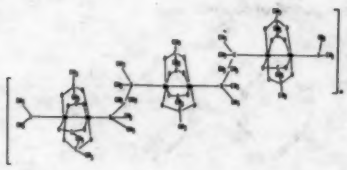
wherein R* and X are as defined above.

4,965,381

ORGANO-METALLIC CRYSTALLINE POLYMER OF MOLYBDENUM CARBOXYLATE AND BIDENTATE LIGAND

Michael C. Kerby, Annandale, and Bryan W. Eichhorn, Madison, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 22, 1988, Ser. No. 289,073
Int. Cl.[5] C07F 9/50, 11/00
U.S. Cl. 556—18 4 Claims



1.

$$\infty^{1}\ [Mo_2(O_2CR)_4((CH_3)_2xCH_2CH_2x(CH_3)_2)]$$

wherein
R is C_1–C_5 alkyl, and
x is phosphorus or nitrogen

4,965,382

BISMUTH-CONTAINING COMPOSITIONS SUITABLE FOR THERAPEUTIC USE

Diego Furlan, Segrate S. Felice, Italy, assignor to Eurosearch S.r.l., Milan, Italy

Filed Jan. 18, 1990, Ser. No. 466,764
Claims priority, application Italy, Jan. 25, 1989, 19172 A/89
Int. Cl.[5] C07F 9/94, 1/06; A61K 31/29
U.S. Cl. 556—79 2 Claims

1. A process for preparing from bismuth citrate a bismuth-based composition in the form of a fine powder easily dispersible in aqueous liquids with the formation of a colloidal solution having antiulcer therapeutic properties, consisting of dissolving equimolar quantities of potassium citrate and bismuth citrate in water and adding the minimum amount of KOH to obtain complete dissolution of the Bi citrate at 60° C., then concentrating the obtained aqueous solution by evaporation under vacuum until a mixed K and Bi citrate concentration of the order of 1.5 moles/l is obtained, and precipitating the product in the form of a fine powder by diluting the aqueous solution with acetone in a quantity of about 60 ml per 100 ml of solution, and finally separating the product by filtration, washing it with acetone, and drying it at 70° C. under vacuum.

4,965,383

ALKALI FREE AND ALKALINE EARTH FREE DIBUTYL TIN DIFLUORIDE POWDER

Jean-Pierre Kerhervo, Montlhery, and Armel Queromes, Villebon Sur Yvette, both of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

Continuation of Ser. No. 765,739, Oct. 14, 1985, Pat. No. 4,694,091. This application Mar. 5, 1987, Ser. No. 21,929
Claims priority, application France, Aug. 22, 1984, 84 13069
Int. Cl.[5] C07F 7/22
U.S. Cl. 556—104 11 Claims

1. A composition comprising a substantially alkali free and alkaline earth free dibutyl tin difluoride obtainable by a process which comprises:
reacting dibutyl tin chloride and an ammonium difluoride to form dibutyl tin difluoride;
forming a solution of said dibutyl tin difluoride;
adding a refractory powder to the solution to act as a recrystallization initiator;
cooling the solution to recrystallize the dibutyl tin difluoride; and
recovering a dibutyl tin difluoride product having spherical grains and being substantially free of alkaline earth and alkali impurities.

4,965,384

PRODUCTION OF COPPER AMINE SALT COMPLEXES FOR CATALYSIS FOR THE OXIDATIVE COUPLING OF ALKYLPHENOLS

Michael D. Clifton, Martinez, and Stephen J. Carter, Augusta, both of Ga., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 98,814, Sep. 18, 1987, Pat. No. 4,851,589. This application May 5, 1989, Ser. No. 348,058
Int. Cl.[5] C07F 1/08
U.S. Cl. 556—110 10 Claims

1. A process for the preparation of a copper amine salt complex useful in the manufacture of 3,3',5,5'-tetraalkyl-4,4'-dihydroxybiphenyls,
wherein the process comprises reacting a copper halide and tetramethylethylenediamine under an inert atmosphere, with a 2,6-dialkylphenol as a solvent and in the presence of an acidic phenol.

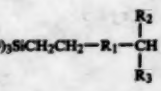
4,965,385

ORGANOSILANE STABILIZERS FOR INORGANIC SILICATES IN ANTIFREEZER/COOLANT COMPOSITIONS

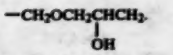
Il Nam Jung; Sang Yo Hwang, and Hae Kyung Bae, all of Seoul, Rep. of Korea, assignors to Korea Advanced Institute of Science and Technology, Seoul, Rep. of Korea

Filed Apr. 12, 1988, Ser. No. 180,489
Claims priority, application Rep. of Korea, Dec. 22, 1987, 14733/1987
Int. Cl.[5] C07F 7/10
U.S. Cl. 556—416 6 Claims

1. Organosilanes of the formula:



useful as a stabilizer of inorganic silicates in antifreezer/coolant formulations, wherein each R is independently an alkyl group of 1–4 carbon atoms, R_1 is selected from the group consisting of



and R_2 is -phenyl and R_3 is —CN.

4,965,386

HYDROSILATION, AND DEHYDROCONDENSATION OF SILICON HYDRIDES, CATALYZED BY SCANDIUM, YTTRIUM AND RARE EARTH METAL COMPOUNDS

Patricia L. Watson, Wilmington, and Frederick N. Tebbe, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 26, 1990, Ser. No. 498,937
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—430 43 Claims

1. A process for the production of polysilanes comprising contacting a silane of the formula $R^1R^2SiH_2$ with a compound of the formula Cp_2MR^2 wherein:

R^1 is hydrogen, saturated hydrocarbyl or aromatic hydrocarbyl;
R^8 is hydrogen, saturated hydrocarbyl or aromatic hydrocarbyl;
Cp is η^5-cyclopentadienyl or η^5-cyclopentadienyl substituted with hydrocarbyl, substituted hydrocarbyl or silyl;
M is scandium, yttrium or a rare earth metal; and
R_2 is saturated or aromatic hydrocarbyl, substituted saturated hydrocarbyl, substituted aromatic hydrocarbyl, hydrogen or silyl.

21. A process for the hydrosilation of alphaolefins comprising contacting an alpha-olefin of the formula $H_2C{=}CR^3R^4$ with a silane of the formula $R^5R^6SiH_2$ in the presence of a catalyst of the formula Cp_2MR^2, wherein:
R^3 and R^4 are independently hydrocarbyl or substituted hydrocarbyl;
R^5 is hydrogen, hydrocarbyl or substituted hydrocarbyl;
R^6 is hydrogen, siloxy, hydrocarbyl or substituted hydrocarbyl;
Cp is η^5-cyclopentadienyl or η^5-cyclopentadienyl substituted with hydrocarbyl, substituted hydrocarbyl or silyl;
M is scandium, yttrium or a rare earth metal; and
R^2 aromatic hydrocarbyl, substituted saturated or aromatic hydrocarbyl, hydrogen or silyl.

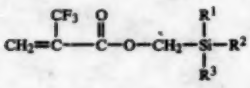
4,965,387

TRIORGANOSILYLMETHYL ESTERS OF α-TRIFLUOROMETHYLACRYLIC ACID

Toshio Shinohara, Takasaki, and Masatoshi Hayashi, Fukui, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1990, Ser. No. 497,165
Claims priority, application Japan, Mar. 24, 1989, 1-72343
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—440 **2 Claims**

1. An organosilicon compound of the following formula



wherein R^1, R^2 and R^3, respectively, represent a monovalent hydrocarbon group having from 1 to 8 carbon atoms.

4,965,388

METHOD FOR PREPARING ORGANOHALOSILANES

Roland L. Halm, Madison, Ind.; Regie H. Zapp, Carrollton, Ky., and Rick D. Streu, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 2, 1990, Ser. No. 459,630
Int. Cl.[5] C07F 7/16
U.S. Cl. 556—472 **13 Claims**

1. In a method for producing a mixture of a methylchlorosilanes by the addition of methyl chloride to a reactor containing a reaction mass comprising silicon metal and a suitable catalyst at a temperatures of from 250° to about 350° C., the improvement consisting essentially of homogeneously blending said methyl chloride with an amount of hydrogen equivalent to from 0.5 to 12 mole percent, based on the combination of methyl chloride and hydrogen, to reduce the concentration of methyltrichlorosilane without substantially decreasing the concentration of dimethyldichlorosilane in the mixture.

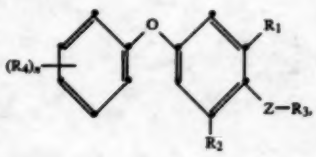
4,965,389

PHENOXYPHENYLTHIOUREAS PHENOXYPHENYLISOTHIOUREAS AND PHENOXYPHENYLCARBODIIMIDES AND USE THEREOF FOR CONTROLLING PESTS

Josef Ehrenfreund, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 1, 1988, Ser. No. 162,536
Claims priority, application Switzerland, Mar. 10, 1987, 878/87; Jan. 11, 1988, 65/88
Int. Cl.[5] C07C 157/09
U.S. Cl. 558—04 **22 Claims**

1. A compound of formula I



(I)

wherein
R_1 is C_3–C_7cycloalkyl or C_5–C_6cycloalkenyl,
R_2 is C_1–C_6alkyl, C_3–C_6cycloalkyl or C_5–C_6cycloalkenyl,
R_3 is C_1–C_8alkyl, C_3–C_6cycloalkyl, 1-cyclopropylethyl or C_3–C_5alkenyl,
R_4 is hydrogen, halogen, C_1–C_4alkyl, C_1–C_3alkoxy or CF_3,
n is an integer from 1 to 3,
Z is —NH—CS—NH—, —N=C(SR$_5$)—NH— or —N=C-=N—, and
R_5 is C_1–C_5alkyl or allyl
or a salt thereof with an organic or inorganic acid.

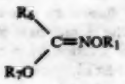
4,965,390

HYDROXAMIC ACID ESTERS

Hans-Dieter Schneider, Weil am Rhein, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 2, 1990, Ser. No. 474,422
Int. Cl.[5] C07C 83/10
U.S. Cl. 558—7 **6 Claims**

1. A compound of the formula VII



(VII)

in which
R_7 is C_1–C_5alkyl, benzyl or C_1–C_4alkoxyethyl;
R_6 is C_1–C_4alkyl, phenyl or benzyl;
R_1 is $-CH_2CR_2{=}CR_3R_4$ or $-CH_2C{=}CR_5$;
R_2 is hydrogen, halogen or methyl;
R_3 is hydrogen, halogen or methyl;
R_4 is hydrogen, halogen or methyl and
R_5 is hydrogen, methyl or ethyl, with the proviso that R_2, R_3 and R_4 are not simultaneously hydrogen.

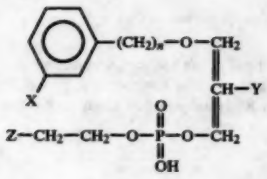
4,965,391

RADIOIODINATED PHOSPHOLIPID ETHER ANALOGUES

Raymond E. Counsell, Ann Arbor, Mich.; Karen L. Meyer, Chapel Hill, N.C., and Susan W. Schwendner, Ann Arbor, Mich., assignors to The University of Michigan, Ann Arbor, Mich.

Filed Oct. 23, 1987, Ser. No. 112,865
Int. Cl.[5] C07F 9/09
U.S. Cl. 558—169 **6 Claims**

1. A compound of the general formula:



where X is selected from the group consisting of radioactive isotopes of iodine; n is an integer between 1 and 15; Y is selected from the group consisting of H, OH,

, and OR wherein R is an alkyl or aralkyl; and Z is selected from the group consisting of NH_2, NR_2, and NR_3, wherein R is an alkyl or aralkyl.

4,965,392

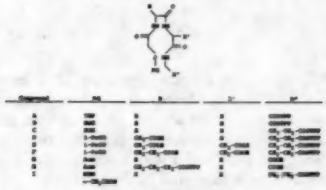
CHELATING COMPOUNDS FOR METAL-RADIONUCLIDE LABELED PROTEINS

Alan R. Fritzberg, Edmonds; Sudhakar Kasina, Kirkland; Tripuraneni N. Rao, Mill Creek; Jean-Luc VanderHeyden, Seattle, and Ananthachari Srinivasan, Kirkland, all of Wash., assignors to NeoRx Corporation, Seattle, Wash.

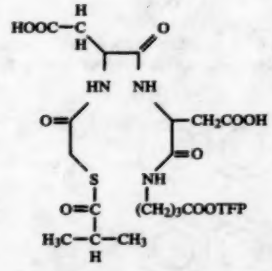
Continuation-in-part of Ser. No. 31,440, Mar. 26, 1987, abandoned. This application Mar. 23, 1988, Ser. No. 172,004

Int. Cl.[5] C07C *69/62, 327/06*

U.S. Cl. 558—254 **6 Claims**



1. A compound of the formula:



wherein COOTFP represents a 2,3,5,6-tetrafluorophenyl ester group.

4,965,393

PROCESS FOR PRODUCING ACRYLONITRILE

Yutaka Sasaki; Kunio Mori, and Kiyoshi Moriya, all of Kanagawa, Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1989, Ser. No. 318,299

Claims priority, application Japan, Mar. 3, 1988, 63-48694

Int. Cl.[5] C07C *253/26*

U.S. Cl. 558—324 **8 Claims**

1. A process for producing acrylonitrile by vapor-phase catalytic ammoxidation of propylene using a catalyst whose composition is represented by the empirical formula (I):

$$P_qR_rMo_{10}Bi_aFe_bSb_cNi_dO_e \quad (I)$$

where

R is Na and/or K;

subscripts q, r, a, b, c, d and e represent atomic ratios, and when the atomic ratio of Mo is 10,

q=0 to 3,

r=0.01 to 1.5,

a=0.1 to 3,

b=0.1 to 2.5,

c=5 to 30,

d=4 to 8, and

e=a number corresponding to the oxide formed by chemical combination of the components described in the formula (I) above.

4,965,394

DIFUNCTIONAL POLYFLUOROAROMATIC DERIVATIVES AND A PROCESS OF PREPARING THE SAME

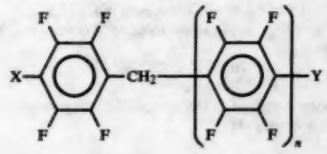
Ludwig A. Hartmann, Wilmington, Del., and John F. Stephen, West Chester, Pa., assignors to ICI Americas Inc.

Division of Ser. No. 853,448, Apr. 18, 1986, Pat. No. 4,783,547, and Ser. No. 223,464, Sep. 6, 1988, Pat. No. 4,866,185. This application May 23, 1989, Ser. No. 355,517

Int. Cl.[5] C07C *255/50, 63/14, 211/09*

U.S. Cl. 558—425 **11 Claims**

1. A compound of the formula



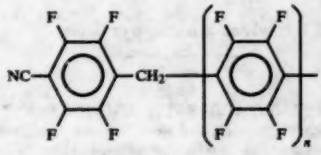
wherein n is either 0 or 1, X and Y are identical and selected from the group consisting of

—$COOR^1$ wherein R^1 is hydrogen or an alkyl group containing 1 to 6 carbon atoms;

—CH_2NH_2;

—CO_2NCO.

6. A process of preparing a compound of the formula:



wherein when n is O, Y is either —CN or —H and n is 1, Y is —CN,

said process comprises reacting pentafluorobenzonitrile with

a Grignard reagent of the formula CH_3MgHal in the presence of an organic solvent selected from the group consisting of tetrahydrofuran to form a product wherein Y is —CN and n = 1; dimethoxyethane or diglyme to form a product where Y is H and n is O; and 1,3-dioxolane to form a product, wherein Y is —CN and n is O, wherein Hal is chlorine or bromine.

4,965,395

P-OXYBENZOIC ACID COMPOUNDS

Kazumi Saeki; Takeshi Inoue, and Shoichi Horie, all of Nakatsu, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

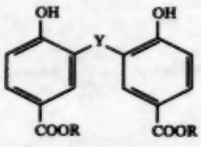
Continuation of Ser. No. 125,351, Nov. 25, 1987, abandoned, which is a continuation of Ser. No. 10,090, Dec. 31, 1986, abandoned. This application Mar. 16, 1989, Ser. No. 324,569

Claims priority, application Japan, May 27, 1985, 60-113867

Int. Cl.[5] C07C *149/40*

U.S. Cl. 560—11 **3 Claims**

1. A p-oxybenzoic acid compound of the general formula:



wherein R is alkyl having not less than two carbon atoms or aralkyl and Y is a sulfur atom or sulfonyl with the proviso that R is not butyl if Y is sulfur.

4,965,396

NITROBENZOYL-3-CYCLOPROPYLAMINOACRYLATES AND A PROCESS FOR THE PREPARATION THEREOF

You Seung Kim; Sang Woo Park, and Jea Cheol Kim, all of Seoul, Rep. of Korea, assignors to Korea Advanced Institute of Science and Technology, Seoul, Rep. of Korea

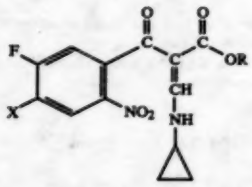
Filed Mar. 10, 1989, Ser. No. 321,971

Claims priority, application Rep. of Korea, Jun. 17, 1988, 7341/1988

Int. Cl.[5] C07C *205/00*

U.S. Cl. 560—21 **1 Claim**

1. A compound of nitrobenzoyl-3-cyclopropylaminoacrylate of the formula (I)



(I)

wherein R is ethyl and X is chloro or fluoro.

4,965,397

NOVEL DIBASIC ACID SALTS AND THEIR SYNTHESIS

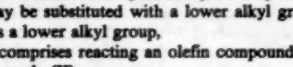
Etienne Schacht, Staden, and Jan Crommen, Gent, both of Belgium, assignors to Ethyl Corporation, Richmond, Va.

Filed Jan. 23, 1989, Ser. No. 298,921

Int. Cl.[5] C07C *101/18*

U.S. Cl. 560—60 **14 Claims**

1. A compound of the general formula



wherein Q is the divalent hydrocarbyl residue of a dibasic acid, R is a hydrogen atom or hydrocarbyl group, R_1 is a hydrocarbyl group, R_2 is a hydrogen atom or hydrocarbyl group, and p is zero or one.

4,965,398

PROCESS FOR PRODUCING OPTICALLY ACTIVE ALPHA-HYDROXYCARBOXYLATES

Koichi Mikami, Kanagawa; Masahiro Terada, Tokyo; Takeshi Nakai, Kanagawa; Noboru Sayo, Kanagawa, and Hidenori Kumobayashi, Kanagawa, all of Japan, assignors to Takasago International Corporation, Tokyo, Japan

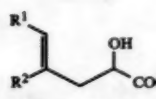
Filed Jul. 28, 1989, Ser. No. 386,480

Claims priority, application Japan, Jul. 28, 1988, 63-189082

Int. Cl.[5] C07C *69/76*

U.S. Cl. 560—60 **6 Claims**

1. A process for preparing an α-hydroxycarboxylate represented by formula (I):



(I)

wherein R^1 represents a hydrogen atom or a lower alkyl group; R^2 represents a lower alkyl group, a phenyl group or a cycloalkyl group, or R^1 and R^2 are bonded to each other to form a five- to seven-membered cycloalkenyl or bicycloalkenyl ring which may be substituted with a lower alkyl group; and R^3 represents a lower alkyl group,

which comprises reacting an olefin compound represented by formula (II):

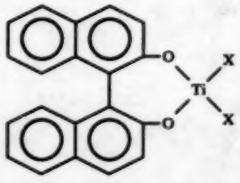
(II)

wherein $R^{1'}$ represents a hydrogen atom or a lower alkyl group; and $R^{2'}$ represents a lower alkyl group, a phenyl group or a cycloalkyl group, or $R^{1'}$ and $R^{2'}$ are bonded to each other to form a five- to seven-membered cycloalkyl or bicycloalkyl ring which may be substituted with a lower alkyl group,

with a glyoxylate represented by formula (III):

(III)

wherein R^3 is as defined above, in the presence of a binaphthol-titanium complex represented by formula (IV):



(IV)

wherein X represents a chlorine atom or bromine atom.

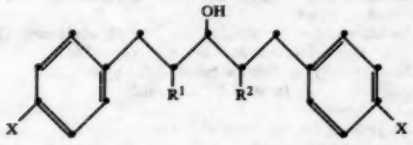
4,965,399

1,5-DIARYL-3-PENTANOL COMPOUNDS AND PROCESSES FOR THE PREPARATION THEREOF

Joseph R. Zoeller, Kingsport, and William W. Blount, Surgoinsville, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 19, 1988, Ser. No. 233,789
Int. Cl.[5] C07C 69/76
U.S. Cl. 560—64 9 Claims

1. A monomer compound having the formula



wherein:

R^1 and R^2 each is hydrogen, alkyl containing up to about 6 carbon atoms or phenyl or collectively R^1 and R^2 are 1,2- or 1,3-alkylene or 1,2-phenylene; and

each X is carboxyl, alkoxycarbonyl of up to about 7 carbon atoms, hydroxyalkoxycarbonyl of up to about 9 carbon atoms, formamido, alkanoylamido having up to about 6 carbon atoms or hydroxyalkoxy having up to about 10 carbon atoms.

4,965,400

PREPARATION OF 3,5-DISUBSTITUTED-4-ACETOXYSTYRENE

Richard Vicari, 25 Hickory Pl., Apt. H1, Chatham Township, Burlington County, N.J. 07928; Mohammad Aslam, 7221 Diamond Ridge, Corpus Christi, Tex. 78413; Wilson B. Ray, 3115 S. Kathleen, Beeville, Tex. 78102; Kenneth G. Davenport, Hoelderlinstr. 6, 6238 Hofheim, Fed. Rep. of Germany; Ralph Dammel, Eibenweg 39, 6500 Mainz-Bretzenheim, Fed. Rep. of Germany; Juergen Lingnau, Karolingerstr. 10, 6500 Mainz-Laubenheim, Fed. Rep. of Germany, and Karl-Friedrich Doessel, Fritz-Kalle-Str. 8, 6200 Wiesbaden, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 97,809, Sep. 16, 1987, abandoned. This application Aug. 2, 1988, Ser. No. 226,260
Int. Cl.[5] C07C 67/00
U.S. Cl. 560—130 10 Claims

1. A process for the production of 3,5-disubstituted-4-acetoxystyrene which comprises (a) conducting a acylation step which consists essentially of acylating 2,6-disubstituted phenol with acetic anhydride under hydrogen fluoride catalysis at a temperature of from about 5° C. to about 100° C. at a pressure of at least about 700 mm Hg for from about 1 to 5 hours to provide 3,5-disubstituted-4-hydroxyacetophenone, then (b) esterifying the 3,5-disubstituted-4-hydroxyacetophenone to produce 3,5-disubstituted-4-acetoxyacetophenone, then (c) hydrogenating the 3,5-disubstituted-4-acetoxyacetophenone to form 1-(3',5'-disubstituted-4'-acetoxyphenyl-)ethanol and then (d) dehydrating the 1-(3',5'-disubstituted-4'-acetoxyphenyl)ethanol to form 3,5-disubstituted-4-acetoxystyrene, wherein each of said 3,5-substitutions are independently C_1 to C_{10} alkyl or alkoxy, amino or halogen.

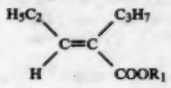
4,965,401

PROCESS FOR THE PREPARATION OF 2-PROPYL-2-PENTENOIC ACID AND ITS ESTERS

Marcel Descamps, and Georges Sayac, both of Muret, France, assignors to Sanofi, Paris, France

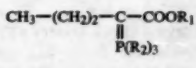
Filed Dec. 1, 1989, Ser. No. 444,828
Claims priority, application France, Dec. 2, 1988, 88 15850
Int. Cl.[5] C07C 67/00
U.S. Cl. 560—210 5 Claims

1. A process for the preparation of the E isomers of the compounds of formula A:



A

in which R_1 is selected from H or C_1–C_4 alkyl, wherein propionaldehyde is reacted with a phosphorus derivative of formula:



I

in which R_1 designates C_1–C_4 alkyl and R_2 is selected from C_1–C_4 alkyl or phenyl, and optionally the compound of formula A in which R_1 is alkyl is hydrolyzed to form the compound of formula A in which R_1 is H.

4,965,402

PROCESS FOR PRODUCING N-PHOSPHONOMETHYLGLYCINE

Dennis P. Riley, Chesterfield, and Willie J. Rivers, Jr., University City, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 112,594, Oct. 26, 1987, Pat. No. 4,853,159. This application Feb. 17, 1989, Ser. No. 311,786
Int. Cl.[5] C07F 9/38
U.S. Cl. 562—17 7 Claims

1. A process for the production of N-phosphonomethylglycine comprising contacting N-phosphonomethyliminodiacetic acid with a molecular oxygen-containing gas in the presence of an aqueous soluble catalyst selected from the group consisting of the salts and salt complexes of manganese.

4,965,403

OXIDATION/DEALKYLATION PROCESS

Donald L. Fields, Jr., Manchester; William H. Miller, Glendale, and Mitchell J. Pulwer, St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 7, 1988, Ser. No. 267,870
Int. Cl.[5] C07F 9/38
U.S. Cl. 562—17 11 Claims

1. A process for producing the alkali metal salts of N-phosphonomethylglycine which comprises reacting, in the absence of a catalyst, an alkali metal hydroxide at a temperature of above about 200° C., with a di-alkali metal salt of an N-alkyl-N-(2-hydroxyethyl)aminomethylphosphionic acid wherein the N-alkyl group is represented by the formula:

wherein R_1, R_2, R_3, and R_4 are independently selected from the group consisting of hydrogen, C_{1-6} alkyl, benzyl, aryl, substituted aryl, and R_3 and R_4 can also be independently selected from halogens, OH, C_{1-4} alkoxy, aryloxy, SH, C_{1-4}

alkylthio, arylthio, —NR_5R_6 wherein R_5 and R_6 are independently selected from hydrogen, C_{1-4} alkyl, and aryl provided that R_3 and R_4 cannot both be —OH, or —SH.

4,965,404

PROCESS FOR THE PREPARATION OF LITHIUM DIPHENYLPHOSPHINOBENZENE-M-MONOSULFONATE

Toshihiko Maeda, Kanagawa, and Noriaki Yoshimura, Okayama, both of Japan, assignors to Kuraray Company, Ltd., Kurashiki, Japan

Filed Feb. 23, 1990, Ser. No. 483,828

Claims priority, application Japan, Mar. 9, 1989, 1-58225

Int. Cl.[5] *C07C 307/00*

U.S. Cl. 562—35 **3 Claims**

1. A process for the preparation of lithium diphenylphosphinobenzene-m-monosulfonate which comprises reacting at least one of sodium salt, potassium salt and calcium salt of diphenylphosphinobenzene-m-monosulfonic acid with lithium sulfate in an organic solvent.

4,965,405

BENZHYDRYLAMINE DERIVATIVES

Susumu Funakoshi, Kyoto, and Eigoro Murayama, Shizuoka, both of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

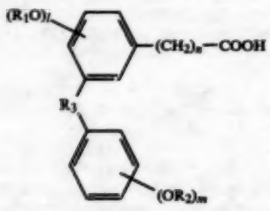
Filed Feb. 27, 1989, Ser. No. 316,167

Claims priority, application Japan, Feb. 29, 1988, 63-46710

Int. Cl.[5] *C07C 229/00*

U.S. Cl. 562—441 **2 Claims**

1. A compound of the formula:



wherein R_3 is >CH-HN-Fmoc or >CH-NH_2; R_1 and R_2 each independently represents a C_{1-3} lower alkyl; n is an integer of 1–4; l is 1 or 2; m is 1 or 2; and Fmoc is 9-fluorenylmethyloxycarbonyl.

4,965,406

PROCESS FOR THE MANUFACTURE OF BENZOIC ACID AND SALTS THEREOF

Jihad Dakka, Triangle; Zoran Amikam, and Yoel Sasson, both of Jerusalem, all of Israel, assignors to Gadot Petrochemical Industries, Inc., Haifa and Yissum Research Development Company of the Hebrew University of Jerusalem, both of Jerusalem, Israel

Continuation of Ser. No. 216,116, Jul. 7, 1988, abandoned. This application Jul. 20, 1989, Ser. No. 384,065

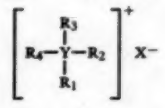
Claims priority, application Israel, Jul. 23, 1987, 83293

Int. Cl.[5] *C07L 51/265*

U.S. Cl. 562—414 **14 Claims**

1. A process for the manufacture of benzoic acid and salts thereof of a high purity from toluene by a liquid phase oxidation of toluene using an oxygen-containing gas, being carried out in the presence of a phase transfer catalyst selected from the group consisting of a quaternary onium salt and a crown ether, and traces of a polar solvent able to solubilize the catalyst, the polar solvent being water, the process being characterized in that the oxidation reaction occurs at an oxygen partial pressure below 50 atmospheres in the presence of a catalytic system comprising:

(a) a quaternary onium salt having the general formula:



wherein: R_1 is alkyl and R_2, R_3 and R_4 may be the same or different, selected from an alkyl, a hydroxyalkyl, an aryl or an aralkyl group, R_1, R_2, R_3 and R_4 having a total number of carbon atoms from 17 to 58,

Y is selected from nitrogen or phosphorus, and

X is selected from F^-, C^-, Br^-, OH^-, CH_3COO^- and HsO^-_4 provided that when Br^- is absent from the system a bromide or bromine is added;

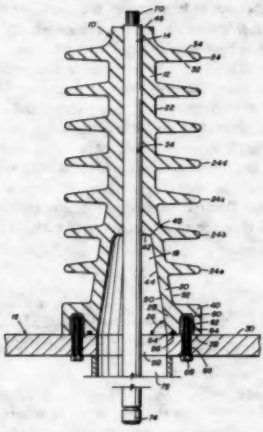
(b) a transition metal salt, the molar ratio between (a) and (b) being from 0.25:1 to 1.5:1.

4,965,407

MODULAR BUSHING

Sidney R. Hamm, Muskego, Wis., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Dec. 9, 1988, Ser. No. 282,700
Int. Cl.[5] H01B *17/26*
U.S. Cl. 174—31 R 23 Claims



1. A modular bushing for mounting over an aperture of a tank having a dielectric medium therein, comprising;

an electrical conductor;

a weathershed of resin molded about and in contact with one end of said conductor for providing mechanical support of said conductor and for sealing said one end to said weathershed, said weathershed adapted for mounting said conductor to the tank and for insulating said conductor from the tank;

said weathershed having a lower mounting flange adapted for insulatively engaging the tank;

a cavity in said weathershed disposed circumferentially about said conductor and having an entrance adjacent said mounting flange; said cavity entrance adapted to be in communication with the aperture of the tank for receiving the dielectric medium; said cavity extending inward of said weathershed beyond said mounting flange;

said conductor having another end protruding from said weathershed through said cavity, for extending through the aperture and into the tank;

the string distance from said cavity entrance to the apex of said cavity being substantially greater than the linear distance between said conductor and said cavity entrance; and

said cavity entrance adapted to be substantially the same size as the aperture.

4,965,408

COMPOSITE SHEET MATERIAL FOR ELECTROMAGNETIC RADIATION SHIELDING

Dwight E. Chapman, Columbus, and David A. DeProspero, Upper Arlington, both of Ohio, assignors to Borden, Inc., Columbus, Ohio

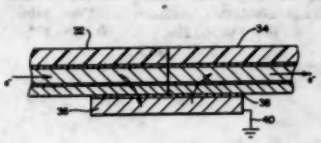
Filed Feb. 1, 1989, Ser. No. 304,575
Int. Cl.[5] H05K *9/00*
U.S. Cl. 174—35 MS 19 Claims

1. A flexible, surface-covering, radiation shielding laminate comprising:

(a) a layer of one of a polymeric or copolymeric film;

(b) a layer of electrically conducting foil having two sides;

(c) a scratch resistant coating bonded to one of said sides of said foil;



(d) an adhesive layer bonding the film to one of said sides of the foil; and

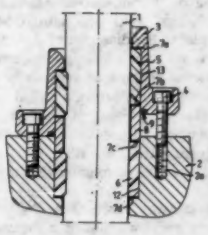
(e) an electrical ground attached to the layer of metal foil.

4,965,409

CABLE ENTRY CONNECTION OF AN ELECTRIC POWER CABLE TO A SUBMERSIBLE MACHINE

Helge Lindroos, Jarfalla, Sweden, assignor to Flygt AB, Solna, Sweden

Filed Aug. 1, 1989, Ser. No. 388,788
Claims priority, application Sweden, Oct. 10, 1988, 8803579
Int. Cl.[5] H02G *15/013;* H02K *5/132*
U.S. Cl. 174—65 SS 3 Claims



1. A cable entry connection of an electric power cable to a submersible machine, comprising:

a submersible machine having a watertight shell (2);

a cable (1) entering said shell (2) at an entry location;

a collar (3) surrounding said cable (1) adjacent the entry location of said cable (1) into said shell (2);

bolt means (4) for securing said collar (3) to said shell (2);

two sockets (5) and (6) of an elastic material surrounding said cable (1), one socket (6) being mounted in said shell (2), and said other socket (5) being mounted in the collar (3);

a ring (8) of a rigid material positioned between said sockets (5) and (6), and adjacent a gap between said collar (3) and shell (2);

first and second pressure discs (*7a–7b*) positioned on the top and bottom of said socket (5), and third and fourth pressure discs (*7c–7d*) positioned on the top and bottom of said socket (6);

an o-ring (9) positioned in said collar (3) adjacent said shell (2); and

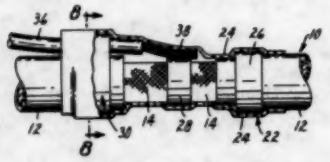
said collar (3) being movable by said bolt means (4) towards and into contact with said shell (2) causing said sockets (5) and (6) to be compressed axially and expanded radially, whereby said cable (1) is secured and sealed.

4,965,410

DAM FOR SHIELD TERMINATORS

Robert J. Spector, Medford, Mass., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 6, 1989, Ser. No. 307,391
Int. Cl.[5] H02G *15/02*
U.S. Cl. 174—78 **18 Claims**



1. A device for encapsulating an exposed portion of a conductor in an insulated cable and a lead wire connection, comprising:

sleeve, means for surrounding the exposed portion of the conductor, said sleeve means having first and second ends;

means for electrically connecting the exposed portion of the conductor to the lead wire, said connecting means being within said sleeve means and positioned intermediate said first and second ends thereof; and

a first thermoplastic dam for sealing the device against environmental influences upon the application of heat having at least two lumens, said first dam being positioned within said sleeve means proximate said first end thereof.

11. A dam for a shield terminator used to encapsulate an exposed portion of a conductor in an insulated cable and a lead wire adjacent to the exposed portion of the conductor, the dam comprising a ring of thermoplastic material having first and second lumens therein, said first lumen having a diameter approximately equal to the diameter of the cable to be encapsulated, and said second lumen having a diameter approximately equal to the diameter of the lead wire to be encapsulated.

13. A method of manufacturing a shield terminator used to encapsulated an exposed portion of a conductor in an insulated cable, a lead wire being adjacent to the exposed portion of the conductor, comprising the steps of:

obtaining a tubular sleeve member having first and second ends;

positioning a first dam member in said sleeve member proximate said first end, said first dam member having at least first and second lumens therein, said first lumen having a diameter approximately equal to the diameter of the cable to be installed and said second lumen having a diameter approximately equal to the diameter of the lead wire to be installed; and

inserting fusible bonding means in said sleeve member intermediate said first and second ends.

4,965,411

SPLICE FOR JOINING THE ARMORING OF TWO WIRE-ARMORED CABLES, AND A METHOD OF MAKING THE SPLICE

Gilles Bruneval, Loon Plage, France, assignor to Societe Anonyme dite : Les Cables de Lyon, Clichy Cedex, France

Filed Jun. 21, 1989, Ser. No. 369,409
Claims priority, application France, Jun. 24, 1988, 88 08507
Int. Cl.[5] H02G *15/103*
U.S. Cl. 174—89 **6 Claims**

1. A splice comprising: two wire-armored cables each having an internal conductor and exterior armoring, and a cable end, the armoring being clamped between concentric, radially inner and outer conical parts at each cable end on each side of the splice, each inner conical part being integral with a flange bolted to one of two similar flanges fixed to opposite ends of a generally tubular flexible assembly, said flexible assembly being constituted by three layers of metal wires comprising a radially innermost first layer wound helically with contiguous turns, and two other radial layers wound successively over the first layer at substantially equal pitches but in opposite directions to each other, each of said flanges having a circular opening therein, the inside diameters of the first layer and of the circular openings in each of two flanges fixed to said first layer being such that said flexible assembly is capable of sliding at one of its ends over at least one of the cables to be connected after its armoring layers have been removed, and at its other end over a splice between said cable conductors.

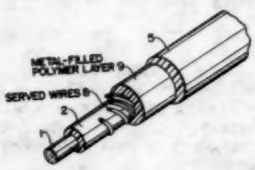
6. A method of making a splice joining the armoring of two wire-armored cables, comprising the steps of: clamping the armoring between concentric, radially inner and outer conical parts at each cable end of the wire-armored cable on each side of the splice, each inner conical part being integral with a flange, bolting the flange of each inner conical part to a respective one of two similar flanges fixed to opposite ends of a generally tubular flexible assembly, forming said tubular flexible assembly of three concentric layers of metal wires by winding an innermost first layer helically with contiguous turns, and winding successively over the first layer at substantially equal pitches, two other layers in opposite directions to each other, forming the inside diameters of said first layer and of circular openings in each of the two flanges fixed thereto such that said flexible assembly is capable of sliding at one of its ends over at least one of the cables to be connected after removing its armoring layer, and at the other end over a splice formed between the conductors of said cables internally of said armoring, threading the outer conical parts over the cable ends after at least one layer of armoring wires are removed therefrom over a certain axial distance thereof, threading the flexible tubular assembly over one of the cable ends, splicing the conductors of the cables together at said cable end, threading the flexible tubular assembly over the other cable end, sliding said flexible assembly over the splice between conductors of respective cables at said cable ends, and bolting of said flexible assembly to the armoring of said one end, and to the armoring of said other end of the two wire-armored cables.

4,965,412

COAXIAL ELECTRICAL CABLE CONSTRUCTION

Vu A. Lai, and Carol A. Menefee, both of Austin, Tex., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Apr. 6, 1989, Ser. No. 334,636
Int. Cl.[5] H01B *11/18*
U.S. Cl. 174—107 **1 Claim**



1. A coaxial electric cable comprising in order:

(a) a conductive metal center conductor surrounded by a layer of (b) porous expanded polytetrafluoroethylene electrical insulation;

(b) surrounding said insulation a conductive wire shield having widely spaced wires wherein from about 10% to

about 55% of the surface of said insulation is covered by said wires;

(c) a wrapped conductive shield which comprises a material selected from the group comprising silver metal-filled polytetrafluoroethylene and carbon-filled polytetrafluoroethylene; and

(d) a protective polymeric jacket.

4,965,413

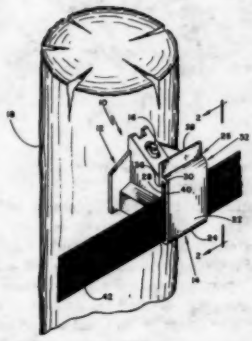
ELECTRIC FENCE INSULATOR WITH LATCHING CAPABILITY

Ronald H. Langlie, and Jon A. Berg, both of Ellendale, Minn., assignors to North Central Plastics, Incorporated, Ellendale, Minn.

Filed Aug. 25, 1989, Ser. No. 398,479

Int. Cl.[5] H01B *17/16*; A01K *3/00*

U.S. Cl. 174—158 F **8 Claims**



1. An electric fence insulator comprising a body having means at the rear thereof for attaching the body to a fence post, a clip unit including a first panel secured to said body and a second panel having its lower end resiliently connected to the lower end of said first panel, said lower ends extending below said body, and a latch mechanism at the upper ends of said panels including a keeper portion at the upper end of one of said panels and a hook portion at the upper end of the other of said panels, said upper ends extending above said body.

4,965,414

CIRCUIT BREAKER AND RESET MECHANISMS OPERATED THROUGH THE BODY

Edward W. Sobotka, Jr., Baldwinsville, and Martin P. Piraino, Jr., Syracuse, both of N.Y., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 31, 1989, Ser. No. 330,855

Int. Cl.[5] H01H *9/00*

U.S. Cl. 200—50 A **16 Claims**

2. An explosion-proof enclosure comprising:

a cast metal body;

a removable cast metal cover;

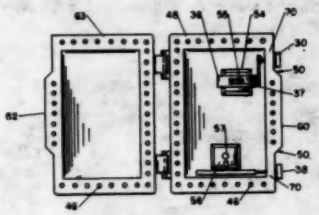
a circuit breaker mounted in said body, said circuit breaker having an actuator switch;

an external operating handle pivotably mounted on said body;

pivotable linkage inside said body connected to said operating handle and engaging said actuator switch;

wherein said circuit breaker is mounted in said body such that said actuator switch is actuated by said linkage upon actuation of said operating handle and pivoting of said linkage, such that said circuit breaker can be tested, operated and aligned with said cover open or closed; and

wherein said metal body and said metal cover have aligned and opposing flanges and wherein said flanges have indentations forming regions of reduced width in the area of said operating handle, and wherein said operating handle



is pivotable in an arcuate path passing through said indentations.

4,965,415

MICROENGINEERED DIAPHRAGM PRESSURE SWITCH

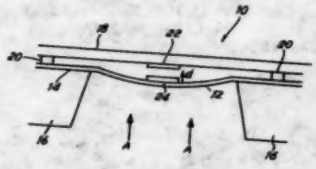
Donald C. Young, Pangbourne, and Philip B. Daniels, Hounslow, both of England, assignors to Thorn Emi plc, London, England

Filed Mar. 16, 1989, Ser. No. 324,413

Claims priority, application United Kingdom, Mar. 17, 1988, 8806383

Int. Cl.[5] H01H *35/34*

U.S. Cl. 200—83 N **6 Claims**



1. A micro-engineered fluid pressure actuated switch including a domed diaphragm undergoing a snap-action response, wherein a first electrical contact is provided on a backing member of said switch and a second electrical contact is provided on said diaphragm so as to cooperate with the first electrical contact, said snap action response being to an applied fluid pressure differential across said diaphragm and thereby causes said contacts to make or break, and wherein said diaphragm is supported on a substrate of semiconductor material.

4,965,416

ACCELERATION AND DECELERATION SENSOR

Rolf Bachmann, Nuremberg, Fed. Rep. of Germany, assignor to W. Günther GmbH, Nuremberg, Fed. Rep. of Germany

Filed May 11, 1989, Ser. No. 350,677

Claims priority, application Fed. Rep. of Germany, May 11, 1988, 8806240[U]

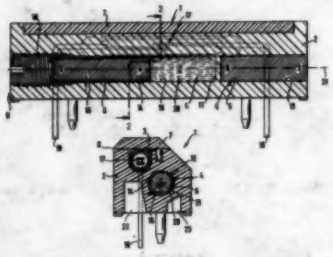
Int. Cl.[5] H01H *35/14, 9/00*

U.S. Cl. 200—61.45 M **12 Claims**

1. In an acceleration and deceleration sensor including a housing; first and second elongate cavities formed in said housing and extending parallel to one another; a reed switch disposed in said first cavity; a first elongate permanent magnet immovably secured in said second cavity; a second elongate permanent magnet longitudinally slidably received in said second cavity and arranged end-to-end relative to the first magnet; said reed switch and the second magnet being arranged with respect to one another such that upon movement

of said second magnet the magnetic field thereof actuates said reed switch; the improvement comprising

(a) a lid cooperating with said first cavity and having a closed and an open position; in said closed position said lid covering said first cavity and being supported by said housing; in said open position said first cavity being ex-



posed to environment external to the housing; said lid being arranged for movement from the closed position to the open position in a direction transverse to the length dimension of said elongate first cavity; and

(b) an adjustment screw closing an end of said second cavity; said second magnet being situated between said end and said first magnet.

4,965,417

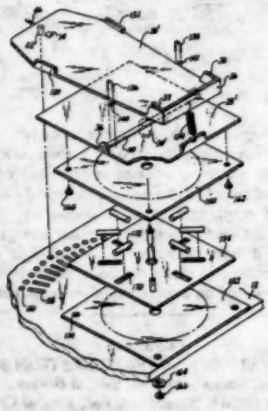
FOOT-OPERATED CONTROL

Philip E. Massie, 4220 Irving Place, Culver City, Calif. 90232

Filed Mar. 27, 1989, Ser. No. 328,895

Int. Cl.[5] H01H *21/26*

U.S. Cl. 200—86.5 **17 Claims**



1. As an article of manufacture, a control device, the device having a plurality of control elements arranged in a series relationship, an actuating member, said actuating member including at least one first part angularly movable about a first axis and including at least one second part angularly movable about a second axis, said first part being angularly moveable to select a control element for actuation and said second part being movable to actuate a selected control element and further including indexing means, the indexing means comprising at least one plug pin, said control device further including a plurality of holes such that at least one hole is associated with each one of said plurality of control elements, each of said plug pins being configured to be moveable within said holes for actuation of a selected control element.

4,965,418

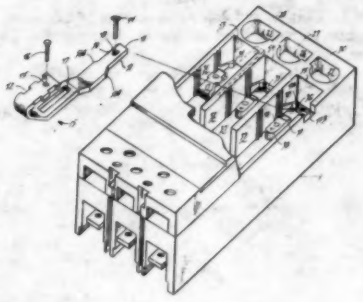
MOLDED CASE CIRCUIT BREAKER LINE STRAP CONFIGURATION

David Arnold, Chester, and Karen B. Kowalczyk, New Britain, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Jan. 3, 1989, Ser. No. 292,717

Int. Cl.[5] H01H *33/02*

U.S. Cl. 200—144 R **9 Claims**



1. A circuit breaker enclosure comprising:

a molded plastic cover;

a molded plastic case including a plurality of line lug compartments at one end and a corresponding plurality of load lug compartments at an opposite end;

a plurality of arc chambers abutting said line lug compartments and separated therefrom by an upstanding compartment wall integrally-formed within said case;

a plurality of line straps within said arc chambers and extending within said line lug compartments through a corresponding plurality of openings through a bottom of said compartment wall, each of said line straps including means formed on one end cooperating with means formed on opposing edges of said openings to thereby prevent the egress of arc gases from said case during circuit interruption.

4,965,419

METAL-CLAD, COMPRESSED GAS-BLAST CIRCUIT-BREAKER

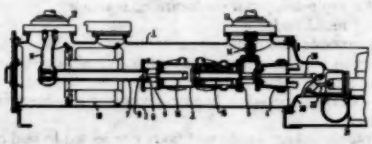
Thomas Chyla, and Manfred Meinherz, both of Berlin, Fed. Rep. of Germany, assignors to Simens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 18, 1990, Ser. No. 467,058

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1989, 3904148

Int. Cl.[5] H01H *33/42*

U.S. Cl. 200—147 R **4 Claims**



1. A metal-clad, compressed gas-blast circuit-breaker having a gas-filled housing and an interrupter unit, supported in the housing by a hollow post insulator and having a movable switching contact connected to a shifting linkage penetrating the post insulator and comprising at least one insulating drive rod, the post insulator having one end area bearing the interrupter unit and being secured at another end area to an outer

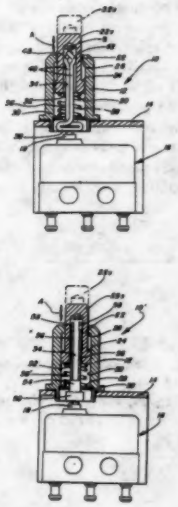
support of the housing, the post insulator penetrated only by the insulating drive rod and comprising only of insulating material and having on the end area facing away from the interrupter unit, on an outside surface, a premolded flanged ring, mounted set back axially from the edge and being adapted to a bearing ring serving as an outer support mounted on the housing.

4,965,420

SWITCH ACTUATOR

William C. Phillips, Aurora, and James F. L. Blair, St. Charles, both of Ill., assignors to Saint Switch, Inc., St. Charles, Ill.

Filed Sep. 21, 1989, Ser. No. 410,347
Int. Cl.[5] H01H *3/48, 13/70*
U.S. Cl. 200—341 **14 Claims**



1. A switch actuator, comprising:

base means;

a plunger mounted for movement on the base means in a given direction from an inoperative position, the plunger having an exposed operating end and an open opposite end communicating with an interior bore extending in said given direction;

relatively movable switch contact means mounted to the base means; and

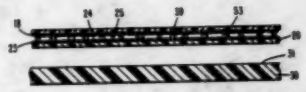
actuator means having a grasping portion including at least one spring arm extending into the bore of the plunger and an actuating portion exposed from the open end of the plunger, the at least one spring arm frictionally grasping the plunger interiorly of the bore as to be movable with the plunger and relatively movable with respect thereto when movement of the actuator means is resisted so that the plunger can overtravel the actuator means, the actuating portion being oriented such that movement of the actuator means may effect relative movement of the switch contact means as a result of said frictional grasping.

4,965,421

PARTICULATE SPACERS FOR TOUCH SENSITIVE OVERLAY PANEL APPLICATIONS

David L. Epperson, Granite Falls, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Continuation of Ser. No. 904,841, Sep. 5, 1986, abandoned, which is a continuation-in-part of Ser. No. 780,313, Sep. 26, 1985, abandoned. This application Nov. 8, 1988, Ser. No. 269,749
The portion of the term of this patent subsequent to Sep. 29, 2004, has been disclaimed.
Int. Cl.[5] H01H *1/10*
U.S. Cl. 200—514 **27 Claims**



1. An apparatus in which two closely spaced apart normally parallel layers of material are positioned to be moved closer relative to one another in order to establish local contact therebetween only when and where one of the normally parallel layers is subjected to the action of an external force, comprising:

a first layer of a first transparent material comprising a first surface and a parallel second surface;

a second layer of a second transparent material comprising a third surface and a parallel fourth surface, said third surface being positioned adjacent and parallel to said second surface of said first layer;

optically-transparent, randomly non-uniformed sized, substantially similarly shaped particles comprising a third material which are randomly distributed in a predetermined density between said first and second layers and adhered to at least one of said second and third surfaces, wherein a largest-sized portion of said particles are in simultaneous contact with said second and third surfaces and said first and second layers are maintained separate at a corresponding distance apart in the absence of an external force applied onto one of said layers such that said adjacent surfaces are placed in contact with one another when and where said external force is applied.

4,965,422

PRESSURE DRIVING CUT-OFF TYPE MANOMETER

Min-Tsu Liu, No. 15, Fu Chou 8 Street, Chia Yi City, Taiwan

Filed Apr. 28, 1989, Ser. No. 344,561
Int. Cl.[5] H01H *35/34*
U.S. Cl. 200—83 S **6 Claims**

1. A manometer device, comprising:

a case for containing components and inside of which is installed a circular tube;

a pointer comprising a cap-shaped body with a cored bottom, and a tip formed upon a peripheral portion of said cap-shaped body;

a scale board fixed upon said case and having scale means disposed upon an upper surface portion thereof for visual cooperation with said pointer tip;

a screw body divided into two sections, one with screw threads extending into said circular tube of said case, and a second section without screw threads having said cored bottom of said pointer fixed thereon;

a sliding carriage comprising a circular tube which is threadedly engaged with said screw threads of said one section of said screw body;

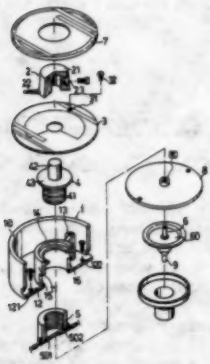
an electrical switch comprising a pair of electrical contacts fixed upon a bottom portion of said sliding carriage and operated by fluid pressure;

a pressure damper fixedly secured upon a bottom portion of said case and having a hole defined therethrough; and

a needle freely penetrating through said hole defined within

said pressure damper, a base portion of said needle being connected to a diaphragm which is mounted upon a bottom portion of said pressure damper;

characterized in that when said screw body is moved by turning said pointer to a predetermined pressure value, upon said scale means of said scale board, which is to be sensed by said manometer, said sliding carriage is caused



to move up and down such that the distance between said electrical contacts of said switch and said needle is adjusted whereby when said fluid pressure coming from a fluid source, and to be measured, reaches said predetermined value, said electrical contacts are opened by means of said needle so as to terminate electrical power to said fluid source.

4,965,423

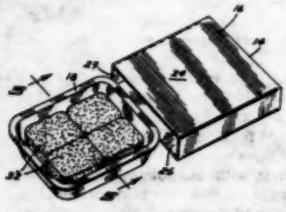
AMPHOTERIC CERAMIC MICROWAVE HEATING SUSCEPTOR COMPOSITIONS

Jonathan Seaborne, Corcoran, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Division of Ser. No. 66,376, Jun. 25, 1987, Pat. No. 4,818,831. This application Nov. 17, 1988, Ser. No. 272,564

Int. Cl.[5] H05B *6/80*

U.S. Cl. 219—10.55 E **13 Claims**



1. An article for use as a microwave heating susceptor in a microwave radiation field which article will absorb microwave radiation to produce heat and to raise the temperature of the article, comprising:

a microwave absorptive body, said body fabricated from a ceramic composition comprising

(a) a ceramic binder, and

(b) a ceramic susceptor material which absorbs microwave energy and having a residual lattice charge, and wherein the ceramic composition is unvitrified.

4,965,424

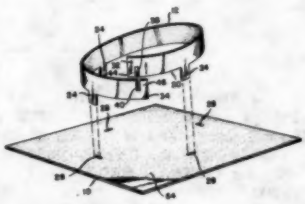
DISPOSABLE FOOD CONTAINER FOR MICROWAVE OVENS

Bruce Bagley, Fort Pierce, Fla., assignor to Mass Market Sales, Inc., Fort Pierce, Fla.

Filed May 25, 1989, Ser. No. 357,337

Int. Cl.[5] H05B *6/80*

U.S. Cl. 219—10.55 E **14 Claims**



1. An assembly for constructing a food container for microwave ovens, comprising:

a base having spaced-apart slots;

a container wall comprising an elongated strip having free ends and spaced-apart tabs at a long side edge of said elongated strip, said slots on said base being adapted to receive said tabs on said container wall strip, end attachment means being provided at said free ends of said container wall strip for securing said free ends together, whereby said tabs can be positioned through said slots and folded under said base to secure said container wall to said strip in an upstanding, substantially closed-perimeter configuration.

4,965,425

AUTOMATIC TURNTABLE FOR MICROWAVE OVEN

Marvin S. Towsend, Rockville, Md., assignor to Genvention, Inc., Rockville, Md.

Filed Oct. 19, 1987, Ser. No. 109,529

Int. Cl.[5] H05B *6/78*

U.S. Cl. 219—10.55 F **67 Claims**

1. A microwave turntable, comprising:

a turntable assembly including a non-rotating portion, a rotating portion, means for turning said rotating portion, and a manually-wound energized turntable energy source for powering said means for turning said rotating portion,

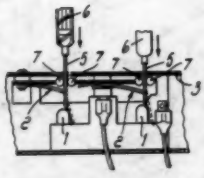
microwave energy responsive means including means for automatically permitting said rotating portion to turn by being driven by said manually-wound energized energy source when exposed to microwave energy and for automatically stopping the turning of said rotating portion when exposure to microwave energy ceases.

4,965,426

APPARATUS FOR INSTANTANEOUSLY DESTROYING USED INJECTION SYRINGE NEEDLES

Giovanni Colombo, Via Trevano, 49, CH-6900 Lugano, Switzerland

Filed Mar. 3, 1989, Ser. No. 318,625
Claims priority, application Italy, Mar. 8, 1988, 19693 A/88
Int. Cl.[5] B23H *9/00*; H05B *3/00*
U.S. Cl. 219—68 **3 Claims**



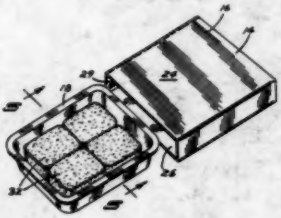
1. An apparatus for destroying injection syringe needles immediately after use, comprising two pairs of electrodes, supplied with an AC current, in contact therewith there are arranged, through guide means, a tip portion and a middle portion of a syringe needle, a switch for controlling electric power supplied to said two pairs of electrodes, said switch, as closed, providing an electrical current flow adapted to melt and blunt at least said tip portion of said syringe needle, each electrode of said two pairs of electrodes consisting of a small carbon block, a flexible reed member and two carbon rollers, said reed member being pivoted at one end thereof and having its other end arranged on a perpendicular line to said small carbon block, said carbon blocks having different heights so that top portions thereof are arranged at a given distance from a top shelf member provided with a plurality of holes for receiving syringe needles.

4,965,427

AMPHOTERIC CERAMIC MICROWAVE HEATING SUSCEPTOR COMPOSITIONS WITH METAL SALT MODERATORS

Jonathan Seaborne, Corcoran, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Division of Ser. No. 94,972, Sep. 10, 1987, Pat. No. 4,808,780.
This application Nov. 14, 1988, Ser. No. 270,179
Int. Cl.[5] H05B *6/80*
U.S. Cl. 219—10.55 E **13 Claims**



1. An article for use as a microwave heating susceptor in a microwave radiation field which article will absorb microwave radiation to produce heat and to raise the temperature of the article, comprising:

a microwave absorptive body, said body fabricated from a ceramic composition comprising:

(a) a binder for a ceramic material,

(b) a ceramic susceptor material which absorbs microwave energy and having a residual lattice charge, and

(c) a metal salt temperature profile moderator, and

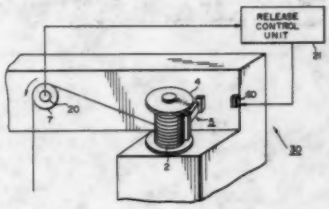
wherein the ceramic composition is unvitrified.

4,965,428

WIRE ELECTRICAL DISCHARGE MACHINING APPARATUS

Miyuki Gotou, and Hiroshi Takeuchi, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1989, Ser. No. 417,940
Claims priority, application Japan, Oct. 7, 1988, 63-253078; Nov. 26, 1988, 63-298786; Aug. 18, 1989, 1-211473
Int. Cl.[5] B23H *7/10*
U.S. Cl. 219—69.12 **8 Claims**



1. A wire electrical discharge machining apparatus comprising: a loosening preventive means (5) for pressing an outer winding peripheral surface of a wire electrode (2) wound around a wire bobbin (4), including means for biasing said loosening preventive means against said bobbin;

a retaining means (60) for retaining said loosening preventive means in a position withdrawn from said wire bobbin;

a wire feeding stop detecting means (20; 120) for detecting a state in which said wire electrode led from said wire bobbin and stretched in a feeding route has stopped feeding; and

a release control unit (21) for releasing said loosening preventive means from said retaining means in response to a command from said wire feeding stop detecting means to press said wire loosening preventing means against said outer winding peripheral surface of said wire electrode and thereby prevent any wire backlash on the bobbin.

4,965,429

ELECTROSTATICALLY SUSPENDED ROTOR FOR ANGULAR ENCODER

Walter Polstorff, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 21, 1989, Ser. No. 396,262
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.68 **20 Claims**

1. Apparatus for encoding a code strip, comprising:

a stator having a cylindrical side wall, a top wall, and a bottom wall defining an inner cavity, said bottom wall comprising a bottom electrode;

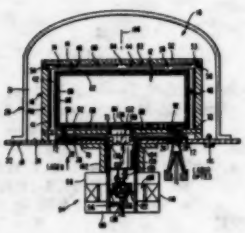
at least first and second flat lift electrodes mounted on the inner surface of said top wall;

at least first and second lateral electrodes mounted on the inner surface of said side wall;

a rotor having a cylindrical side wall, a top wall and a bottom wall located in and rotatable in said cavity;

a thin electrically conductive coating substantially com-

pletely covering said rotor top, side, and bottom walls; and



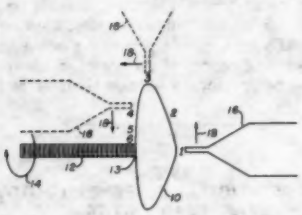
circuit means supplying electrical potential to said stator top and side electrodes to electrostatically suspend and position said rotor within said stator cavity.

4,965,430

METHOD OF LASER MACHINING MOLDS WITH MICROTEXTURED SURFACES

James M. Curtis, Bartlett, Tenn., and Ronald S. Sanders, Eden Prairie, Minn., assignors to Dow Corning Wright Corp., Arlington, Tenn. and Lumonics Material Processing Corporation, Eden Prairie, Minn.

Filed Sep. 18, 1989, Ser. No. 408,847
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.69 **8 Claims**



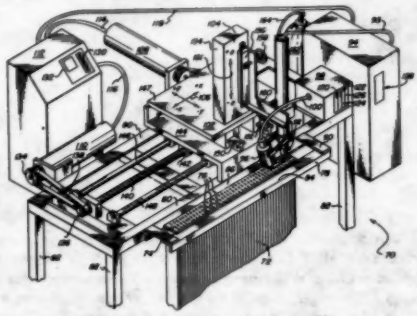
1. A process for preparing a mandrel for forming envelopes for implantation in the human body, which envelopes are provided with micropillars on the exterior surface thereof, comprising providing a workpiece of solid stock material in the general shape of the desired envelopes, positioning said workpiece for rotation on a supporting means, moving a pulsing laser beam, directed at said rotating workpiece, around the anterior and posterior surfaces of said workpiece between a point adjacent the anterior center of rotation to a point adjacent the posterior center of rotation in a plane parallel to the axis of rotation of said workpiece while maintaining the focal point of said beam approximately at each workpiece surface at which it is directed, controlling the rate of pulsing of said laser beam and the speed of rotation of said workpiece to produce patterns of blind microholes of predetermined depth and diameter, thereby producing an array of blind microholes over substantially the entire surface of said workpiece.

4,965,431

SWEEP WELDING METHOD AND APPARATUS THEREFOR

John Mouteleone, Jamestown, N.Y., assignor to Blackstone Corporation, Jamestown, N.Y.

Filed Aug. 21, 1989, Ser. No. 397,102
Int. Cl.[5] B23K *9/08*
U.S. Cl. 219—123 **46 Claims**



1. Method of welding a tube to a tube plate wherein a tube end formed by a tube end sidewall protrudes through an aperture in said plate to provide a joint for welding said sidewall to said plate in the region of said aperture, said method comprising the steps of:

(a) moving a welding head, and thus its welding arc, in a selected direction along a path of travel to form a weldment along said joint where said welding arc encounters said joint; and

(b) simultaneously with step (a), reciprocating said welding arc back and forth in a crossways direction relative to said selected direction of movement of said welding head, and independent of movement of said welding head, with an amplitude of reciprocation sufficient to encounter at least a portion of said joint lying to at least one side of said path to further form a weldment along said joint portion as said arc moves in said selected direction;

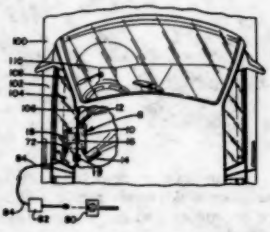
whereby welding of at least a part of said joint can be accomplished to the side of said path as well as along said path.

4,965,432

PORTABLE VEHICLE HEATER

Jack W. Harris, 125 Flanders Rd., Woodbury, Conn. 06798

Filed Jul. 7, 1989, Ser. No. 376,638
Int. Cl.[5] B60H *1/22*
U.S. Cl. 219—203 **21 Claims**



1. A portable vehicle heater comprising:

(a) a housing;

(b) a plurality of ducts attached electrically and mechanically to said housing, each having an inlet and an outlet with electrical heating means and a blower means posi-

tioned within said ducts, between said inlet and between said outlet;

(c) a manually settable timer means connected to an electrical relay means adapted to selectively interrupt the electrical continuity of an electrical connection between said heating means and blower means and an AC power source; and

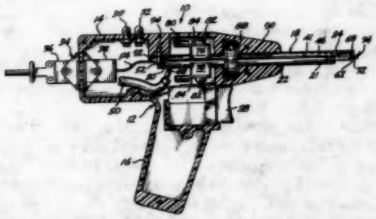
(d) an attachment arm of a tough, flexible band flexibly connected to said housing having incorporated therein a plurality of electrical conductors connecting an electrical connector to said relay means and being attached to the end of said band distal of said housing.

4,965,433

VACUUM PICKUP TOOL WITH INTEGRALLY HEATED SOLDERING TIP

Kurt F. Hanke; Wesley C. Lund, both of Seattle, and David F. Feider, Renton, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 9, 1988, Ser. No. 281,985
Int. Cl.[5] H05B *3/00*
U.S. Cl. 219—230 **16 Claims**



1. A hand-held tool for picking up and soldering a connector clip onto a wire wrap pin, the tool comprising:

a handle;

a barrel mounted to the handle, the barrel having a tip;

means for holding the connector clip to the tip using a vacuum; and,

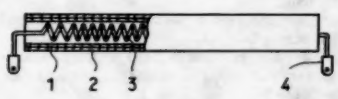
means for heating the tip to effect soldering of the connector clip to the pin.

4,965,434

FAR-INFRARED HEATER

Shoichi Nomura, Kobe; Akira Kitagawa, Osaka; Hidekata Kawanishi, Ikeda, and Tsuneo Shibata, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma; Shima Trading Co., Ltd., Osaka and Parker Kako Co., Ltd., Tokyo, all of, Japan

Filed Apr. 4, 1989, Ser. No. 332,904
Claims priority, application Japan, Apr. 8, 1988, 63-87516
Int. Cl.[5] H05B *3/10*
U.S. Cl. 392—407 **1 Claim**



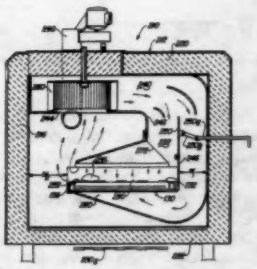
1. A far-infrared heater comprising a heat source and a protective means which has a far-infrared-emitting layer of 3 to 150 μm in thickness formed thereon by applying thereto a coating composition to cause gelation of the coating layer by polymerization, the coating composition comprising (i) a liquid composition which contains a ceramics-forming material and which is capable of forming a ceramics layer by gelation induced by polymerization and (ii) at least one pigment capable of emitting far-infrared radiation.

4,965,435

FORCED CONVECTION TUNNEL OVEN

Donald P. Smith, 4630 Woodfin Dr., Dallas, Tex. 75220; William W. Plumb, Dallas, and Jarald E. High, Grand Prairie, both of Tex., assignors to Donald P. Smith, Dallas, Tex.

Continuation-in-part of Ser. No. 54,748, May 27, 1987, Pat. No. 4,831,238, which is a continuation-in-part of Ser. No. 787,524, Oct. 15, 1985, Pat. No. 4,835,351. This application May 16, 1989, Ser. No. 352,507
Int. Cl.[5] F24H *3/04*
U.S. Cl. 219—388 **10 Claims**



1. A tunnel oven comprising: a cooking compartment; a front wall and a rear wall on said cooking compartment; a conveyor having edges and upper and lower surfaces, said upper surface lying in a plane in said cooking compartment, said conveyor being adapted to transport food through said compartment between said front wall and said rear wall; an air distribution chamber spaced from said conveyor; air circulating means having an intake to draw air from said cooking compartment and adapted to discharge air into said air distribution chamber; a plenum in said cooking compartment between said rear wall and one edge of said conveyor; air dispensing means having air dispensing openings communicating with said plenum for dispensing air toward one of said conveyor surfaces, said conveyor being spaced from said front wall of said cooking compartment a distance sufficient to permit passage of substantially all of the air delivered through said plenum between a first edge of said conveyor and the rear wall through space between the other edge of said conveyor and the front wall enroute to the intake of said air circulating means.

4,965,436

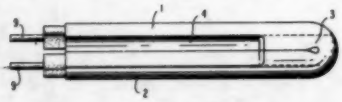
HEATER UNIT

John W. Churchill, Beverly, Mass., assignor to Southport Enterprises, Beverly, Mass.

Continuation of Ser. No. 301,134, Sep. 11, 1981, abandoned, which is a continuation of Ser. No. 513,140, Oct. 8, 1974, Pat. No. 4,349,727, which is a continuation-in-part of Ser. No. 382,295, Jul. 25, 1973, Pat. No. 3,482,099. This application Dec. 2, 1985, Ser. No. 803,524
Int. Cl.[5] H05B *3/44*
U.S. Cl. 219—544 **48 Claims**

1. A heater unit comprising resistor means, terminal means connected to the ends of said resistor means, first surrounding elongated metallic sheath means, compacted powder insulation material disposed within said first sheath means and spacing said resistor means from said first sheath means, said first sheath means being provided with indentation means extending along at least a portion of the length of said first sheath means, said first surrounding elongated metallic sheath means

including at least one sheath in the form of two substantially parallel adjacent leg portions interconnected by a return bend portion formed of said one sheath bent back upon itself and being integral with the adjacent parallel extending leg portions, said terminal means being provided at the adjacent ends of said one sheath and having said resistor means connected therebetween, said compacted resistor means extending in the direction of said one sheath and being spaced therefrom by said compacted powder insulation material, each of said leg portions of said one sheath having in cross section. at least a first flat surface portion and arcuate surface portions forming a closed loop, said at least first flat surface portions of each leg portion being adjacent and facing one another, said indentation



means extending along at least a portion of at least one of said leg portions, whereby said heater unit is capable of withstanding testing voltages greater than 2200 volts.

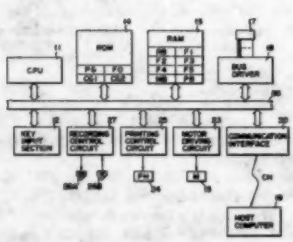
38. A method of forming a heater unit, comprising the steps of providing a heater having an elongated metallic sheath surrounding a resistor helix with powdered insulation material spacing the resistor helix from the sheath and terminal means connected to the ends of the resistor helix extending outwardly from the respective ends of the sheath, the elongated metallic sheath being in the form of two substantially parallel leg portions interconnected by a return bend portion formed of the sheath bent back upon itself and integral with the adjacent parallel extending leg portions, and forming an indentation extending along at least a portion of the length of the sheath.

4,965,437

TICKET ISSUING APPARATUS

Junshiro Nagai, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1989, Ser. No. 304,818
Claims priority, application Japan, Feb. 5, 1988, 63-25167
Int. Cl.[5] G06F *7/08*
U.S. Cl. 235—381 **8 Claims**



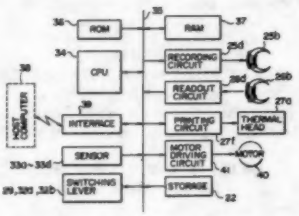
1. A ticket issuing apparatus comprising:
a printing section;
a communicating circuit to which a desired host computer is connected by means of a communication channel;
a port section to which a memory card for storing a printing format is detachably connected; and
control means for causing said printing section to print ticket data received by said communicating means on paper in accordance with the printing format stored in said memory card, thereby issuing the paper as a ticket.

4,965,438

TICKET ISSUING APPARATUS

Harutoshi Murofushi, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 287,404
Claims priority, application Japan, Dec. 24, 1987, 62-328105
Int. Cl.[5] G07B *15/02*
U.S. Cl. 235—384 **7 Claims**



1. A ticket issuing apparatus comprising:
a feeding path for sheets of ticket paper on which magnetic stripes are respectively formed;
a feeding mechanism for feeding the ticket paper along said feeding path;
a recording section provided on said feeding path for recording ticket data on the magnetic stripe of the ticket paper;
a readout section provided on said feeding path for reading out the ticket data from the magnetic stripe of the ticket paper which has passed said recording section;
a printing section provided on said feeding path for printing display data on the ticket paper; and
ticket evaluation means for checking the ticket data read out by said readout section, causing said feeding mechanism to feed the ticket paper back to said recording section when the ticket data is detected to be erroneously recorded, checking the ticket data which has been recorded again and read out by said readout section, and determining the ticket paper as an ineffective ticket when the ticket data is detected to be erroneously recorded again.

4,965,439

MICROCONTROLLER-CONTROLLED DEVICE FOR SURVEYING, RANGEFINDING AND TRAJECTORY COMPENSATION

Sidney D. Moore, 2173 N. Wilkes Ct., Claremont, Calif. 91711

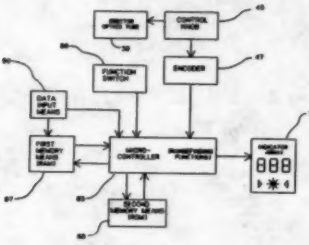
Continuation-in-part of Ser. No. 752,463, Jul. 5, 1985, Pat. No. 4,777,352, which is a continuation-in-part of Ser. No. 207,946, Nov. 18, 1980, Pat. No. 4,431,052. This application Sep. 14, 1988, Ser. No. 245,860
Int. Cl.[5] G05F *15/58*; F41G *3/06*; G01C *3/20*
U.S. Cl. 235—404 **18 Claims**

6. An optical instrument through which a target of preselected size can be viewed, comprising:
an objective lens;
an ocular lens;
an erector lens mounted to pivot between the objective lens and the ocular lens;
a first image plane of focus defined by the objective lens;
a second plane of focus between the ocular lens and the erector lens;
a microcontroller carried on the optical instrument;
a spanning reference viewable on the first image plane;
means for pivoting the erector lens to view the images of the spanning reference and target on the first image plane in relation to a reference indicator on the second image plane viewable on the first image plane to thereby adjust the apparent spacing between the spanning reference and the reference indicator in response to the user's viewing the

target through the instrument to span the size of the target;

means for producing a first control signal sent to the microcontroller representative of the preselected size of the target;

means for producing a second control signal sent to the



microcontroller representative of the set spacing between the spanning reference and the reference indicator; and

range measuring means responsive to the second control signal for automatically producing a third control signal representative of the range from the instrument to the target as determined from the set spacing and said preselected size of the target.

4,965,440

INFORMATION REPRODUCING APPARATUS

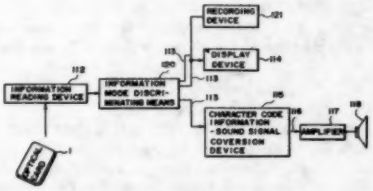
Kouyo Hasegawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 942,619, Dec. 17, 1986, abandoned. This application Sep. 29, 1989, Ser. No. 414,573

Claims priority, application Japan, Dec. 19, 1985, 60-284228

Int. Cl.[5] G06F 7/00

U.S. Cl. 235—487 **5 Claims**



1. An information reproducing apparatus comprising:

information reading means for reading predetermined information recorded on an information recording carrier;

first output means for outputting said predetermined information read by said information reading means in a first form;

second output means for outputting said predetermined information read by said information reading means in a second form different from said first form; and

output selecting means for selecting the forms for outputting from said first and second output means based upon said predetermined information read by said information reading means, wherein said predetermined information includes discrimination information recorded on said information recording carrier for use in determining which of said first and second output means should be selected, and wherein said information reading means reads said discrimination information, and said output selecting means selects the forms for outputting based upon said discrimination information read by said information reading means.

4,965,441

METHOD FOR THE SCANNING CONFOCAL LIGHT-OPTICAL MICROSCOPIC AND INDEPTH EXAMINATION OF AN EXTENDED FIELD AND DEVICES FOR IMPLEMENTING SAID METHOD

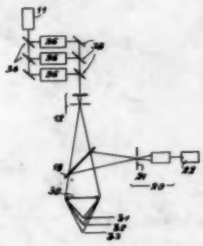
Bernard Picard, Saint Martin D'Heres, France, assignor to Commissariat a l'Energie Atomique, France

Filed Feb. 26, 1989, Ser. No. 302,479

Claims priority, application France, Jan. 27, 1988, 88 00934

Int. Cl.[5] G01J 1/20

U.S. Cl. 250—201.3 **16 Claims**



1. Method for the scanning confocal light-optical microscopic and in-depth examination of an extended field, wherein:

a principal luminous beam is formed constituted by a plurality of secondary luminous beams possessing characteristics, the secondary luminous beams distinguished from each other by virtue of at least one of their characteristics,

by means of focussing means, the various secondary luminous beams are focussed onto the object to be examined at points of different altitude,

the secondary luminous beams reflected by the object to be examined are sent to a detection system,

the light intensity of the secondary beams is detected,

the signals detected are digitally analysed and processed,

a scanning of the principal luminous beam is carried out as regards all the object to be examined.

4,965,442

SYSTEM FOR ASCERTAINING DIRECTION OF BLUR IN A RANGE-FROM-DEFOCUS CAMERA

Bernd Girod, Boston, and Edward H. Adelson, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 7, 1989, Ser. No. 433,577

Int. Cl.[5] G01J 1/20

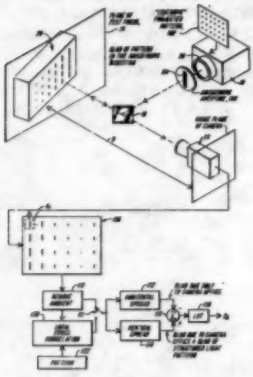
U.S. Cl. 250—201.7 **8 Claims**

1. A range determining system, comprising:

means for optically projecting a limited depth of field pattern of light and dark areas having high spatial frequency onto an object for permitting determination of the range of surface patches on said object from a predetermined plane, with said pattern being focused to a plane of best focus; and,

means for determining the range of a surface patch on said object from said plane of best focus by measuring the degree of blur of said pattern on said object at said surface patch, said projecting means including optics having a lens with a non-point symmetric anisotropic aperture,

thereby to project a distinctive pattern onto said object, the orientation of said distinctive pattern providing an



indication of whether said surface patch is in front of or behind said plane of best focus.

4,965,443

FOCUS DETECTION APPARATUS USING NEURAL NETWORK MEANS

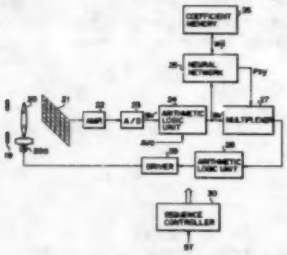
Masafumi Yamasaki; Toshiyuki Toyofuku; Junichi Itoh, all of Hachioji, and Shinichi Kodama, Hino, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1989, Ser. No. 414,943

Claims priority, application Japan, Oct. 4, 1988, 63-250466

Int. Cl.[5] G01J *1/20*

U.S. Cl. 250—201.7 **10 Claims**



1. A focus detection apparatus comprising:

light-receiving means having a plurality of photoelectric transducer elements arranged in a two dimensional matrix;

an optical system for focusing an object image on said light-receiving means and outputting analog signals representing brightnesses of respective parts of an object;

means for converting the analog signals output from said light-receiving means into digital signals;

neural network means for receiving the digital signals output from said converting means and determining a main part of the object;

means for selecting a signal representing the brightness of the main part determined by said neural network means from the digital signals output from said converting means; and

focus detecting means for performing focus detection on the basis of an output from said selecting means.

4,965,444

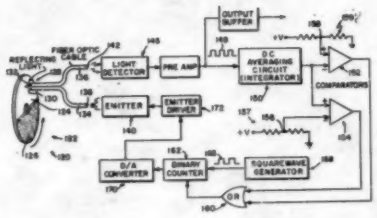
AUTOMATIC GAIN CONTROL FIBER OPTICA-TO-ELECTRICAL TRANSCEIVER

Varce E. Howe, Zionsville, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Filed Aug. 17, 1988, Ser. No. 233,164

Int. Cl.[5] G01V *1/32*

U.S. Cl. 250—205 **13 Claims**



1. An output control for a light source, the light source being responsive to an input electrical signal to increase or decrease its output depending upon whether the input electrical signal corresponds to a higher light output level than the source is currently providing or a lower light output level than the source is currently providing, respectively, the gain control comprising first means for monitoring the light output and for producing a signal related thereto, second means for establishing a maximum desired light output, third means for establishing a minimum desired light output, fourth means for comparing the first means signal to the maximum and minimum desired light outputs, means for coupling the first, second, and third means to the fourth means, fifth means for selectively generating a periodic signal, means for coupling the fourth means to the fifth means, and means for coupling the fifth means to the light source, the fifth means providing the periodic signal as the input electrical signal to the light source in response to the fourth means determining that the first means signal is not related to a light output between the maximum desired light output and the minimum desired light output.

4,965,445

ROTATION ANGLE DETECTOR WITH OUTWARDLY EXTENDING RADIAL PROJECTIONS

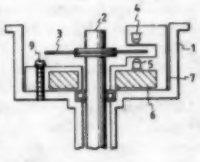
Masayuki Ikeuchi, and Koichi Okamura, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1989, Ser. No. 372,591

Claims priority, application Japan, Aug. 5, 1988, 63-103202[U]

Int. Cl.[5] G01D *5/34*

U.S. Cl. 250—231.13 **5 Claims**



1. A rotational angle detector comprising:

a case for housing a rotary shaft; and

a detection unit including;

a detection element provided between said case and said

shaft so as to send out a signal corresponding to a rotation of said shaft, and

a processing circuit for processing said signal and sending out a signal corresponding to a rotational angle of said shaft; and

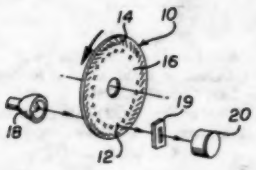
at least three projections provided on an outside circumferential surface of said detection unit and extending outwardly from said unit in a direction that is radial with respect to said shaft so as to be in contact with an inside circumferential surface of said case.

4,965,446

OPTICAL INTERRUPTER SYSTEM WITH VIBRATION COMPENSATION

Tom Vyse, San Diego, Calif., assignor to IVAC Corporation, San Diego, Calif.

Filed Apr. 20, 1989, Ser. No. 340,847
Int. Cl.[5] G01D *5/34*
U.S. Cl. 250—231.14 **9 Claims**



1. An optical encoder apparatus for determining position of a moving member, comprising:

a source of illumination;

detector means for receiving said illumination and for producing an output signal indicating the quantity of illumination received;

said moving member having a plurality of optical flags arranged sequentially on said moving member such that said flags are sequentially interposed in a light path between said source and said detector means, said optical flags being spaced apart and separated by a null illumination portion of said moving member which is not operative to transmit or reflect said illumination to said detector, each of said flags being operative to transmit or reflect said illumination to said detector means, each of said optical flags having a principal illumination portion and first and second intermediate illumination portions on either side of said principal illumination portion such that the waveform of the detector means output signal has a normal sequence of a null amplitude portion corresponding to said null illumination portion less than a first threshold, a first intermediate amplitude portion corresponding to said first intermediate illumination portion greater than said first threshold and less than a second threshold, principal amplitude portion corresponding to said principal illumination portion greater than said second threshold, and a second intermediate amplitude portion corresponding to said second intermediate illumination portion greater than said first threshold and less than said second threshold; and

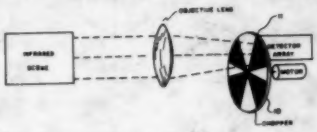
signal processing means operative to sense said null, first intermediate, principal, and second intermediate waveform amplitude portions and to generate a count signal responsive only to sensing a sequence of said null, intermediate, and principal portions, and whereby said signal processing means is not subject to generating an erroneous count signal responsive to sensing of sequences of only two of said illumination portions due to directional changes of movement of said moving member.

4,965,447

CHOPPER FOR STARING INFRARED SYSTEMS

Vincent T. Bly, Springfield; Conrad W. Terrill, Lorton, and Donna J. Advena, Springfield, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 28, 1988, Ser. No. 225,410
Int. Cl.[5] G01D *5/36*
U.S. Cl. 250—233 **3 Claims**



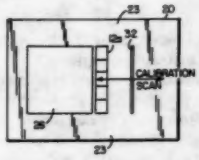
1. An improved chopper for a detector array of a narrow band of electromagnetic radiation, wherein the chopper is in the form of a disk adjacent to said detector and whose thickness is many times the wavelengths of radiation in said band and which is tranparent to said radiation and which is partially covered with a pattern on one side, wherein said pattern has an optical thickness of one-half wavelength for a particular one of said wavelengths and is transparent to said radiation, wherein the disk is rotatable about an axis parallel to the optical path between said radiation and said detector to alternately interpose its pattern covered and uncovered portions in said optical path.

4,965,448

INTERNAL CALIBRATION SOURCE FOR INFRARED RADIATION DETECTOR

Paul G. Morse, Westford, and Charles C. Petty, Lexington, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 24, 1986, Ser. No. 855,851
Int. Cl.[5] G01M *11/00*
U.S. Cl. 250—252.1 **14 Claims**



1. An internal calibration source for an infrared radiation detector which scans a normal field of regard;

a low emissivity surface with a high emissivity reticle thereon;

means to focus an image of said detector on said surface so that said image is retroreflected back to said detector; and

means to scan said image between said high and low emisivity region of said surface.

4,965,449

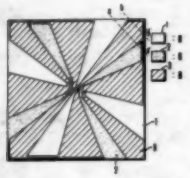
COLOR INFORMATION DETECTING DEVICE

Masao Suzuki; Ryosuke Miyamoto; Nobuo Fukushima, and Takeshi Ogawa, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 20, 1989, Ser. No. 325,548
Claims priority, application Japan, Mar. 23, 1988, 63-067179; Apr. 4, 1988, 63-081296
Int. Cl.[5] G01J *3/50*
U.S. Cl. 250—226 **15 Claims**

1. A color information detecting device having a plurality of

color sensors each of which is composed of a photo-electric conversion element for converting light of a specific wave length region wherein each of said plurality of color sensors is composed of a plurality of polygonally split pieces which



radially extend and spread from a substantially central part of said color information detecting device and wherein, among said plurality of color sensors, a color sensor which has a relatively low sensitivity is arranged to have a greater number of said split pieces than other color sensors.

4,965,450

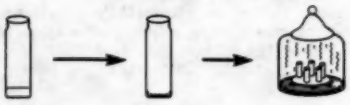
RADIOACTIVE ASSAY FOR MEASURING WATER ABSORPTION BY HUMECTANTS

John R. Schiltz, Ramsey, and Wanda Nabial, Somerville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 815,484, Jan. 2, 1986, abandoned. This application Nov. 28, 1988, Ser. No. 276,821

Int. Cl.[5] G01N *37/00*; G21H *5/02*

U.S. Cl. 250—303 **15 Claims**



1. A method for determining the humectancy of an epidermal moisturizing material comprising (1) drying said material to remove substantially all water; (2) placing said material in a sealed chamber in the presence of radioactive water and allowing said material to remain in said sealed chamber for a predetermined period of time to absorb radioactive water vapor; and (3) removing said material from said sealed chamber and measuring the radioactivity of said material.

4,965,451

METHOD AND APPARATUS FOR THE CONTACTLESS TESTING OF THE SURFACE AND INNER STRUCTURE OF A SOLID WORKPIECE

Hans-Joachim Sölter, Schumannstrasse 44b, 2822 Schwanewede, Fed. Rep. of Germany

Filed Jun. 14, 1989, Ser. No. 366,741

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1988, 3820862

Int. Cl.[5] G01N *21/00, 21/63*

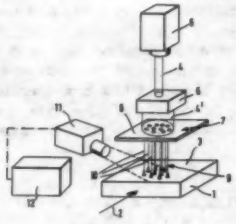
U.S. Cl. 250—330 **14 Claims**

1. A method for the contactless testing of the surface and inner structure of a solid workpiece, comprising:

(a) projecting a single pulse of an electromagnetic exciting beam onto the surface of the workpiece;

(b) breaking up said single pulse prior to contact with the surface of the workpiece into a multiplicity of individual component beams so that their images are simultaneously projected onto said workpiece combined in a field or line;

(c) measuring the workpiece generated infra-red radiation; and



(d) processing the measured infra-red radiation to determine the locally and temporarily induced workpiece temperature.

4,965,452

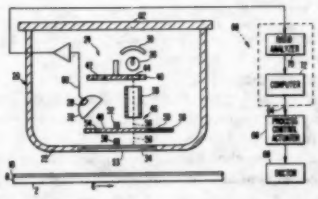
INFRARED ANALYSIS OF PAPER PRINTABILITY

Steven P. Sturm, Columbus, Ohio, assignor to Process Automation Business, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 217,185, Jul. 11, 1988. This application Sep. 22, 1989, Ser. No. 410,790

Int. Cl.[5] G01N *21/35*

U.S. Cl. 250—339 **4 Claims**



1. A sensor for infrared analysis of paper printability, the paper being a kaolinite clay coated sheet with its printability dependent upon the flatness of kaolinite alumino-silicate clay platelets on the surface thereof, which flatness can be determined by calculating the ratio of the absorption bands from two specific types of structural hydroxyls which are characteristic of kaolinite clay platelet crystals, namely, a first type of hydroxyls whose internuclear axes are inclined toward vacant octahedral crystal positions relative to the kaolinite clay's silicate plate and a second type of hydroxyls where internuclear axes are normal to the silicate plate, said sensor comprising:

a source housing containing a radiation source that emits infrared radiation over a spectral band which includes a plurality of selected narrow bands, the plurality including a first band of measurement radiation having a center wavelength selected from a peak absorption range for said first type of hydroxyls, and a second band of measurement radiation having a center wavelength selected from a peak absorption range for said second type of hydroxyls,

a detector housing for receiving radiation emitted from the source after the radiation has interacted with the clay platelets on the surface of the coated sheet,

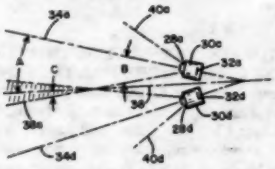
means responsive to said first and second bands of radiation for producing separate electrical indications for each of the two bands of the intensity of radiation that has interacted with the clay platelets on the surface of the coated sheet and for producing a signal indicative of clay platelet flatness.

4,965,453

MULTIPLE APERTURE IR SENSOR

Arnold Hoschette, Eden Prairie; Jay M. Ellingboe, Edina, and Allen Lubke, Excelsior, all of Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Sep. 17, 1987, Ser. No. 97,831
Int. Cl.[5] G01C *1/00*; G01J *1/20*
U.S. Cl. 250—349 14 Claims



1. Apparatus for determining the location of a source of energy relative to an object, including:

an object having a longitudinal axis extended forwardly and rearwardly thereof;

a detecting means including a plurality of energy detectors, each detector having an individual field of view and adapted to receive energy from an energy emitting source located within its individual field of view, said detectors being mounted with respect to said object to position the individual fields of view of said detectors in an array about said longitudinal axis to form a composite field of view for said detecting means; and

a plurality of signal generating means, one associated with each of said detectors, each signal generating means producing a signal indicating the detection of said energy emitting source within the individual field of view of its associated detector, a composite of said signals indicating which of said individual fields include said source and thereby indicating the approximate location of said source within said composite field of view, wherein each of said individual fields of view circumscribes said longitudinal axis, to form within said composite field an intersection field of view including said individual fields of view and encompassing said longitudinal axis, said composite field including an angle of from 20° to 60°, and said intersection field including an angle of less than 4°.

4,965,454

METHOD AND APPARATUS FOR DETECTING FOREIGN PARTICLE

Toshihiko Yamauchi, and Nobuyuki Akiyama, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 18, 1989, Ser. No. 298,574
Claims priority, application Japan, Jan. 21, 1988, 63-9482; Feb. 5, 1988, 63-23672
Int. Cl.[5] G01N *21/47, 21/17, 21/21*
U.S. Cl. 250—372 13 Claims

1. A method for detecting a foreign particle comprising the steps of:

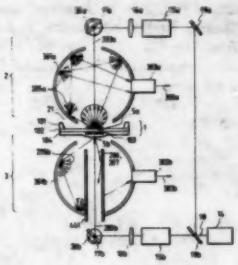
radiating an ultraviolet light beam having a wavelength not larger than 380 nm in the form of a spot to a sample comprising at least one of a circuit pattern and a wiring pattern formed on a substrate and an organic protective film formed on the pattern;

allowing said spot and said sample to scan relatively to each other;

allowing said ultraviolet light to be absorbed by said organic protective film;

condensing diffracted light from the foreign particle present on the organic protective film by means of an integrating sphere;

sensing the condensed light by means of an optoelectro transducer to convert the condensed light into an electric signal; and



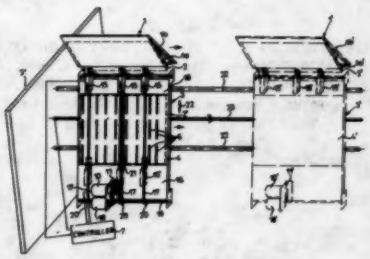
detecting the foreign particle on said organic protective film in accordance with said electric signal.

4,965,455

X-RAY IMAGING FILM AND APPARATUS FOR HANDLING IT

Rudolf Schneider, Pfaffenhofen; Jürgen Müller, Munich, and Volkmar Voigtländer, Eichenau, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Mar. 8, 1989, Ser. No. 320,777
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1988, 3810094
Int. Cl.[5] G01N *23/04*; G03B *42/04*
U.S. Cl. 250—484.1 32 Claims



1. In combination with an x-ray film formed of:

a flexible sheet having a front face and a rear face;

a layer of an x-ray stimulable phosphor on the front face; and

a layer of a magnetically attractable material on the rear face;

a film handling apparatus comprising:

structure forming a flat support surface of a size at least equal to that of the film;

at least one permanent magnet imbedded in the structure and extending over the surface, whereby the rear face of the film can be adhered magnetically to the surface;

an array of stripping elements distributed over the surface and each displaceable through the surface between a recessed position below the surface and an advanced position projecting past the surface; and

actuator means for displacing the elements from their recessed to their advanced position and thereby lifting from the surface a film clinging magnetically to the surface.

4,965,456

RADIATION GUARD MEANS

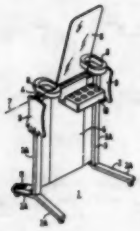
Gerd Huettenrauch, Uttenreuth, and Herbert Schelschshorn, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 22, 1989, Ser. No. 355,272

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1988, 8807462

Int. Cl.[5] G21F *3/00*

U.S. Cl. 250—515.1 **24 Claims**



1. Radiation shielding means comprising:

(a) a freely displacing carriage constructed to carry a radiation shielding wall;

(b) a mounting member carried on said carriage, said mounting member being height adjusted; and

(c) a radiation shielding wall supported by said mounting member including two wall members, said first wall member being positioned below said second wall member, said second wall member comprising a transparent element, and said second wall member being pivoted around a horizontal axis, said radiation shielding wall shielding upper and lower portions of a body against radiation.

4,965,457

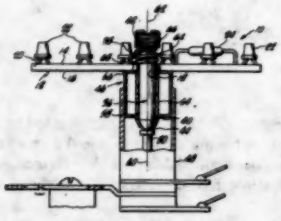
REMOVABLE PANEL ILLUMINATING MODULE

Avi Wrobel, 2404 32nd St., Santa Monica, Calif. 90405; Qamar Lodhie, P.O. Box 91072, Los Angeles, Calif. 90009, and Sajid Rafique, 14705 S. Normandie Apt. 10, Gardena, Calif. 90247

Filed Feb. 17, 1989, Ser. No. 312,745

Int. Cl.[5] F21V *21/00*

U.S. Cl. 362—249 **18 Claims**



1. A panel illuminating module comprising:

(a) a planar baseboard having an upper baseboard surface and a parallel lower baseboard surface;

(b) a plurality of light-emitting electrical units affixed to the upper baseboard surface, the light-emitting electrical units being electrically interconnected to form an array having opposite electrical poles;

(c) an electrically conductive cylindrical base connector adapted to connect to a corresponding female connector socket having oppositely charged electrical poles, the base connector being affixed to the baseboard such that its longitudinal axis is substantially perpendicular to the plane of the baseboard; and

(d) means for electrically connecting the light-emitting electrical units to form a closed circuit with the oppositely charged poles of the female connector; wherein the base connector is rotatable about its longitudinal axis while the baseboard is kept stationary.

4,965,458

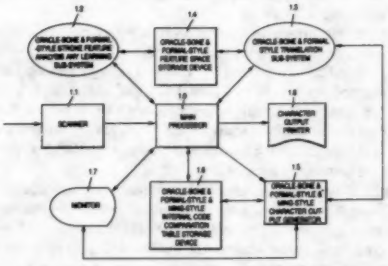
APPARATUS FOR TRANSLATING ORACLE-BONE SCRIPTURE INTO A MORE FORMAL LANGUAGE

Bor-Shenn Jeng; Gan-How Chang; Kuang-Yao Chang; Jsann-Shyong Liu; Jangkeng Liu; Jei-Shoung Hwang; T-Min Wu; Keh-Hwa Shyu; Char-Hin Miou, and Lake Can, all of Tao Yuan Hsien, Taiwan, assignors to Telecommunication Laboratories, Directorate General of Telecommunications, Ministry of Communications, Taiwan

Filed Aug. 10, 1988, Ser. No. 230,754

Int. Cl.[5] G06F *15/38*

U.S. Cl. 364—419 **5 Claims**



1. An apparatus for translating oracle-bone scripture style characters into formal style characters, and for translating formal style characters into oracle-bone scripture style characters, said apparatus comprising:

a scanner for scanning printed characters and for providing a digital representation of the thus scanned printer characters, the printed characters being one of either the oracle-bone scripture style characters or the formal style characters;

an oracle-bone scripture style and formal style character stroke feature analysis and learning means for extracting a feature of each scanned printed character, and for storing into an oracle-bone scripture style and formal style feature space storage device the thus extracted features of each scanned printed character according to a learning and analysis process;

an oracle-bone scripture style and formal style character translation means for translating the scanned printed characters in accordance with the extracted features stored in said oracle-bone scripture style and formal style feature space storage device;

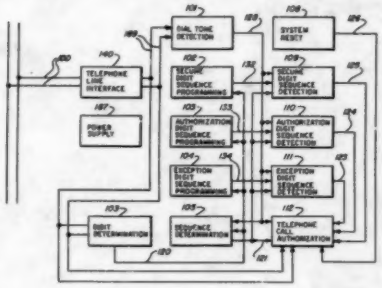
character output generator having incorporated therein a character compressor, said character output generator for generating output characters and said character compressor for reducing a required memory space for storage of said characters;

a processor means for controlling said scanner, said oracle-bone scripture style and formal style character stroke feature analysis and learning means, said oracle-bone scripture style and formal style feature space storage device, said oracle-bone scripture style and formal style characters translation means, and said character compressor.

4,965,459
TELEPHONE LINE SECURITY SYSTEM

Thorntone E. Murray, 9898 Forum Park Rd., Houston, Tex. 77036

Filed May 26, 1989, Ser. No. 125,260
Int. Cl.[5] H04M *1/19, 1/66*
U.S. Cl. 379—189 3 Claims



1. A telephone line security system which controls the telephone numbers which may be called on a telephone line, comprising:

a telephone line interface circuit which is connected to the telephone line and provides electrical isolation between the telephone line and the telephone line security system;

a dial tone detection circuit which is connected to the telephone line interface circuit that provides an output signal when a dial tone is detected on the telephone line;

a digit determination circuit which is connected to the telephone line interface circuit and provides an output unique to each digit of a telephone number asserted onto the telephone line;

a secure digit sequence programming circuit which is subscriber programmable and stores each sequence of digits occurring in telephone numbers which are to be prohibited;

an authorization digit sequence programming circuit which is subscriber programmable and stores each sequence of digits which are selected to be code number sequences;

an exception digit sequence programming circuit which is subscriber programmable and stores each sequence of digits which occur in telephone numbers which are selected to be exceptions to the sequences of digits occurring in telephone numbers which are to be prohibited;

a sequence determination circuit which produces an output upon receipt of each input from the digit determination circuit, which output indicates the number of the input within a sequence of the inputs;

a system reset circuit which produces an output that resets a telephone call authorization circuit upon initial application of power to the telephone line security system;

a secure digit sequence detection circuit which produces an output if the sequence of digits input from the digit determination circuit coincides with a sequence of digits stored in the secure digit sequence programming circuit;

an authorization digit sequence detection circuit which produces an output if the sequence of digits input from the digit determination circuit coincides with a sequence of digits stored in the authorization digit sequence programming circuit;

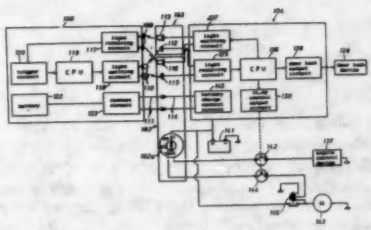
an exception digit sequence detection circuit which produces an output if the sequence of digits input from the digit determination circuit coincides with a sequence of digits stored in the exception digit sequence programming circuit;

said telephone call authorization circuit is connected to the telephone line interface circuit and asserts an output onto the telephone line which makes communication impossible if the secure digit sequence determination circuit has an output, if the exception digit sequence determination circuit does not have an output, and the telephone call placed immediately prior was not of a sequence of digits which caused the authorization digit sequence determination circuit to produce an output.

4,965,460
ANTI-THEFT SYSTEM FOR A VEHICLE

Akira Tanaka, Saitama; Masaaki Fukamachi, and Kazuhiro Sakata, both of Miyazaki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha and Kabushiki Kaisha Honda Lock, both of, Japan

Filed Aug. 24, 1988, Ser. No. 236,063
Claims priority, application Japan, Aug. 25, 1987, 62-210553; Aug. 25, 1987, 62-210549; Aug. 25, 1987, 62-210552; Aug. 25, 1987, 62-210544; Aug. 25, 1987, 62-210554; Aug. 25, 1987, 62-210555; Aug. 25, 1987, 62-210556; Aug. 25, 1987, 62-210557
Int. Cl.[5] B60R *25/04;* B62D *45/00*
U.S. Cl. 307—10.2 15 Claims



1. A vehicular anti-theft system for a vehicle, comprising:

a key switch turnable with a matching key between a first position suitable for receiving said key therein and corresponding to an inoperative state of the vehicle, and a second position corresponding to an operative state of said vehicle;

electronic code matching means for detecting an electronic code signal transmitted from a transmitter incorporated in said key;

control means for enabling said vehicle when said key switch is turned with said matching key to said second position and said electronic code matching means has detected a matching code signal from said transmitter; and

trigger means for acting upon said control means so as to detect said matching code signal transmitted from said transmitter;

wherein said trigger means is activated when the position of said key switch is between a third position, which is between said first position and said second position, and a fourth position, which is between said third position and said second position.

4,965,461
AUTOMATIC LIGHT-EXTINGUISHING CIRCUIT

George F. McRoberts, Jr., 16219-121st Ave. NE., Bothell, Wash. 98011, and Thomas J. Moran, 10421 Tenth Pl. SE., Lake Stevens, Wash. 98258

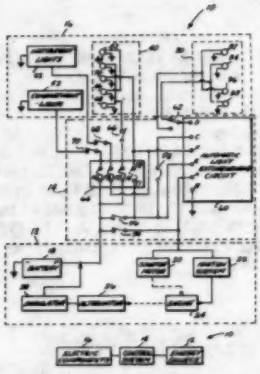
Filed Jul. 18, 1988, Ser. No. 220,618
Int. Cl.[5] H01H *47/18*
U.S. Cl. 307—10.8 8 Claims

1. A circuit, for use in a vehicle that includes a source of electric energy, electric components, and an ignition switch, comprising:

a control switch, including a heating element and a control element, said heating element being connectable to the ignition switch;

a diode; and

a first relay, including a first solenoid and a first power switch element, said first solenoid being connectable to the ignition switch by said diode and to the source of electric energy by said control switch element, said first



power switch element being connectable between the source of electric energy and the electric components, said first solenoid being energizable to operate said first power switch elemeat and control the supply of energy to the electric components, said heating element being energizable to operate said control switch element.

4,965,462

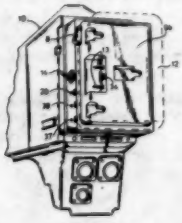
STAND-BY POWER SUPPLY

James J. Crawford, Ringwood, N.J., assignor to Frezzolini Electronics Inc., Hawthorne, N.J.

Filed Aug. 31, 1987, Ser. No. 90,935

Int. Cl.[5] H02J 7/00; H01M 10/44

U.S. Cl. 307—66 **11 Claims**



1. A stand-by power supply comprising:

first connector means for electrically connecting to a load;

second connector means for electrically connecting to and disconnecting from a main battery;

an auxiliary battery;

circuit means electrically connected to the first and second connector means and the auxiliary battery for applying the main battery across the load and responsive to the disconnecting of the main battery from the second connector means to apply the auxiliary battery across the load.

4,965,463

FLAT FREQUENCY, CONSTANT VOLTAGE POWER SOURCE DEVICE

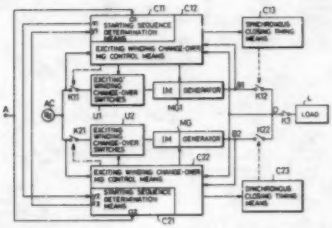
Tsutomu Maruyama, and Koichi Kobayashi, both of Tokyo, Japan, assignors to Sanyo Denki Co., Ltd., Japan

Continuation of Ser. No. 204,241, Jun. 9, 1988, abandoned. This application Jun. 13, 1989, Ser. No. 366,288

Claims priority, application Japan, Jun. 15, 1987, 62-148753; Jan. 27, 1988, 63-16314

Int. Cl.[5] H02P 9/00

U.S. Cl. 307—87 **2 Claims**



1. A flat frequency, constant voltage power source device for use in parallel operation in a plurality of electric generators, the device comprising:

a plurality of circuits, each circuit respectively corresponding to one of said plurality of electric generators and including:

(i) an electric generator including a generator and an induction motor directly coupled to said generator and having an output side and exciting windings provided for three phases capable of being connected in first and second configurations,

(ii) a switch group connected to the exciting windings of said electric generator for connecting said exciting windings of said induction motor in the first and second configurations,

(iii) a first switch disposed between a commercial power source and said electric generator for connecting said electric generator to the power source,

(iv) a second switch disposed between said electric generator and a load for connecting the output side of said electric generator to the load, and

(v) means for determining starting sequence of the plurality of electric generators based on an externally provided start signal and start preparation completion signals transmitted between said means for determining starting sequence; and

control means connected to said first switch, said switch group, and said second switch of each circuit for controlling each of said circuits, said control means including:

means connected to outputs of each of said circuits for detecting any phase difference between an output voltage of said electric generator of one of said circuits which has already been connected through said second switch to said one circuit to the load and output voltages of said electric generators of remaining circuits to be connected to the load in parallel with said electric generator of said one circuit, and

means for operating said switch group in accordance with the starting sequence determined by said starting sequence determination means and responsive to a detected phase difference to change over said winding connection in said electric generators of said remaining circuits from the first configuration to the second configuration in accordance with the phase difference detected for each electric generator of each remaining circuit to vary rotor slips of said electric generators of said remaining circuits to vary the output frequency of each output voltage, thereby varying

the phase difference, and operating said switch group to change over said winding connection from the second configuration to the first configuration and operating said second switch of each remaining circuit to connect said electric generator of each remaining circuit to the load at a time when the phase difference is made zero

wherein each of said means for determining starting sequence of said circuits includes:

(a) means for receiving a start signal,

(b) means for executing a start preparation routine,

(c) means operative on completion of the start preparation routine for transmitting a start preparation completion signal to starting sequence determining means of other of the plurality of circuits, and

(d) means for restarting the start preparation routine upon receipt of a start preparation completion signal from a starting sequence determination means of another of the plurality of circuits,

wherein said means for operating changes over each of said electric generators of said circuits when each of said means for determining starting sequence of each of said circuits completes the start preparation routine.

4,965,464

POWER AMPLIFIER CIRCUIT FOR INTEGRATED DIGITAL CIRCUITS

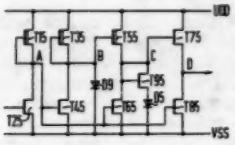
Paul-Werner Von Basse, Wolfratshausen; Jean-Marc Dortu, Munich; Andreas Herlitzek, Munich; Dieter Kohlert, Munich, and Ulrich Schaper, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 19, 1989, Ser. No. 409,577

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1988, 3835119

Int. Cl.[5] H03K *3/01, 19/094*

U.S. Cl. 307—270 **9 Claims**



1. An amplifier circuit comprising:

a first field effect transistor (T16), a second field effect transistor (T26), a third field effect transistor (T36), a fourth field effect transistor (T46), a fifth field effect transistor (T56), a sixth field effect transistor (T66), a seventh field effect transistor (T76) and an eighth field effect transistor (T86);

the first field effect transistor (T16), the third field effect transistor (T36) and the fifth field effect transistor (T56) being NON (normally on) transistors;

the second field effect transistor (T26), the fourth field effect transistor (T46), the sixth field effect transistor (T66), the seventh field effect transistor (T76) and the eighth field effect transistor (T86) being NOFF (normally off) transistors;

drain terminals of the first field effect transistor (T16), of the third field effect transistor (T36), of the fifth field effect transistor (T56) and of the seventh field effect transistor (T76) connected to one another;

source terminals of the second field effect transistor (T26), of the fourth field effect transistor (T46), of the sixth field effect transistor (T66) and of the eighth field effect transistor (T86) connected to one another;

a source terminal of the first field effect transistor (T16) connected to a gate terminal of the first field effect transistor (T16), to a drain terminal of the second field effect transistor (T26), to a gate terminal of the fourth field effect transistor (T46), to a gate terminal of the sixth field effect transistor (T66) and to a gate terminal of the eighth field effect transistor (T86);

a source terminal of the third field effect transistor (T36) connected to a gate terminal of the third field effect transistor (T36), to a drain terminal of the fourth field effect transistor (T46) and to a gate terminal of the fifth field effect transistor (T56);

a source terminal of the fifth field effect transistor (T56) connected to a drain terminal of the sixth field effect transistor (T66) and to a gate terminal of the seventh field effect transistor (T76);

a source terminal of the seventh field effect transistor (T76) connected to a drain terminal of the eighth field effect transistor (T86);

a diode (D6) having a positive terminal and a negative terminal;

the drain terminal of the eighth field effect transistor (T86) connected to the positive terminal of the diode (D6); and

the source terminal of the eighth field effect transistor (T86) connected to the negative terminal of the diode (D6).

4,965,465

MONOSTABLE MULTIVIBRATOR CAPABLE OF GENERATING A PREDETERMINED WIDTH OF PULSE WITHOUT USING A DELAY CIRCUIT

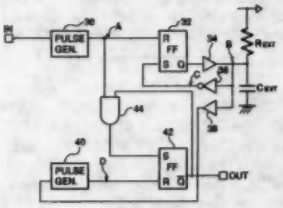
Akira Denda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 7, 1989, Ser. No. 390,998

Claims priority, application Japan, Aug. 6, 1988, 63-196475

Int. Cl.[5] H03K *3/284, 3/017, 5/08, 3/01*

U.S. Cl. 307—273 **3 Claims**



1. A monostable multivibrator comprising an input terminal receiving a trigger signal, a time constant circuit having at least a capacitor, a first pulse generator connected to the input terminal for generating a first pulse in synchronism with a leading edge of the trigger pulse, a first set-reset flipflop having a reset input connected to the first pulse generator and a Q output connected through a discharge circuit to one end of the capacitor, a first Schmitt circuit having an input connected to the one end of the capacitor and an output connected to a set input of the first flipflop, the first Schmitt circuit having a first threshold corresponding to a potential slightly higher than a potential of a logical low level so that the Schmitt circuit can detect a substantial discharge of the capacitor, a second Schmitt circuit having an input connected to the one end of the capacitor and having a second threshold corresponding to a potential slightly lower than a potential of a logical high level so that the Schmitt circuit can detect a substantial charge of the capacitor, a second pulse generator having an input connected to an output of the second Schmitt circuit for generating a second pulse in synchronism with a leading edge of the output of the second Schmitt, a second set-reset flipflop having a reset input connected to receive the second pulse from the second pulse generator and a $\overline{Q}$ output connected to an output terminal, and a logic gate having a first input connected to the output of the first pulse generator, a second input connected to

the $\overline{Q}$ output of the second flipflop and an output connected to a set input of the second flipflop.

4,965,466

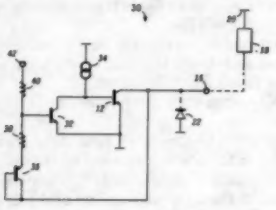
SUBSTRATE INJECTION CLAMP

John M. Pigott, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 19, 1989, Ser. No. 381,871

Int. Cl.[5] H03K *3/01, 5/08*

U.S. Cl. 307—296.2 **10 Claims**



2. A substrate protection circuit including a pre-existing first transistor having a base, a collector and an emitter coupled to a source of operating potential; and first means responsive to a control signal and coupled to the base of the first transistor for rendering the first transistor conductive and non-conductive; wherein the improvement comprises second means coupled between the collector of the first transistor and first means wherein said second means enables the first transistor to operate in an inverse active mode for sourcing current from the emitter through the collector to limit the voltage at the collector to a predetermined value wherein the use of a pre-existing first transistor substantially reduces the die area required to provide substrate injection projection.

4,965,467

SAMPLING SYSTEM, PULSE GENERATION CIRCUIT AND SAMPLING CIRCUIT SUITABLE FOR USE IN A SAMPLING SYSTEM, AND OSCILLOSCOPE EQUIPPED WITH A SAMPLING SYSTEM

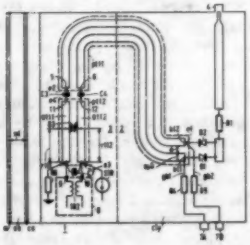
Jan A. Bilterijst, Enschede, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 16, 1989, Ser. No. 324,375

Claims priority, application Netherlands, Mar. 21, 1988, 8800696

Int. Cl.[5] H03K *17/74, 17/14*

U.S. Cl. 307—352 **14 Claims**



1. A sampling system comprising, a sampling circuit having a signal input for supplying a signal to be sampled and having a first and second pulse input for respectively supplying a first sampling pulse and a second sampling pulse in phase opposition, first and second sampling diodes coupling said signal input to a signal output of the sampling circuit, a pulse generation circuit, coupled to the sampling circuit via the pulse inputs, for generating the first and second sampling pulse, and means for balancing the sampling system, said balancing means comprising a microstrip transmission line symmetrically coupled between said first and second pulse inputs and said first and second sampling diodes.

4,965,468

HIGH RESOLUTION, FULLY DIFFERENTIAL CMOS COMPARATOR

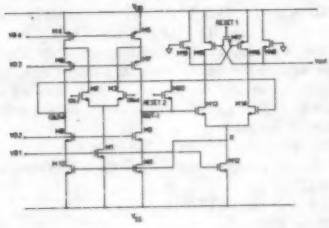
Germano Nicollini, Piacenza, and Pierangelo Confalonieri, Canonica d'Adda, both of Italy, assignors to SGS-Thomson Microelectronics s.r.l., Agrate Brianza, Italy

Filed Oct. 5, 1989, Ser. No. 417,588

Claims priority, application Italy, Oct. 6, 1988, 83669 A/88

Int. Cl.[5] H03K *5/24, 3/356*

U.S. Cl. 307—362 **2 Claims**



1. A fully differential CMOS comparator utilizing a single, high-gain, fully differential, operational amplifier having a "folded cascode" configuration and having two input terminals IN+ and IN−, connected respectively to a switched capacitance input circuit for storage-subtraction of an offset voltage of the amplifier and of comparison, and two output terminals OUT+ and OUT− , functionally connected respectively to two input terminals of a latch circuit, said comparator producing on an output terminal of said latch circuit a logic signal indicative of the level of a signal fed to a first input terminal of said switched capacitance input circuit as compared to a constant reference voltage fed to a second input terminal of said switched capacitance input circuit and wherein

said latch circuit is provided with a differential input stage formed by a differential pair of transistors having their respective sources connected in common and to the drain of a third transistor acting as a biasing current generator of the circuit;

said differential input stage transferring an output signal produced by said high-gain, fully differential, operational amplifier to two input nodes of a latch formed by at least a pair of cross-coupled transistors and by a reset switch connected between the gates of said cross-coupled pair of transistors;

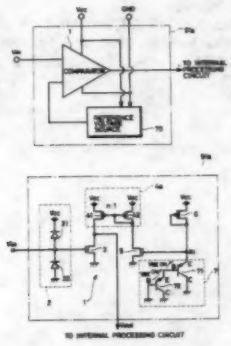
a pair of output transistors of said fully differential, "folded cascode", operational amplifier having their respective gates connected in common and to the node of said sources connected in common of said differential pair of transistors of said differential input stage of the latch circuit, realizing a common mode feedback by means of said differential input stage of the latch circuit which controls the output common mode voltage of said high-gain operational amplifier.

4,965,469

INPUT CIRCUIT OPERABLE UNDER DIFFERENT SOURCE VOLTAGES IN SEMICONDUCTOR INTEGRATED CIRCUIT

Harufusa Kondoh, and Takeo Nakabayashi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 8, 1990, Ser. No. 461,967
Claims priority, application Japan, Apr. 12, 1989, 1-92564
Int. Cl.[5] H03K *19/003, 19/088, 17/14, 17/687*
U.S. Cl. 307—446 9 Claims



1. An input circuit provided in a semiconductor integrated circuit and operable with any of different supply voltages, and input circuit being connected to receive an external input signal having a logic value prescribed by a predetermined first or second voltage range, said input circuit comprising:

a reference voltage source for generating a fixed reference voltage that is independent of the level of said supply voltage, said reference voltage source comprising at least one bipolar transistor having an emitter-base junction, means connected to said supply voltage for turning on said bipolar transistor, a fixed voltage thereby being developed across said emitter-base junction, and means for providing said fixed voltage as said reference voltage; and

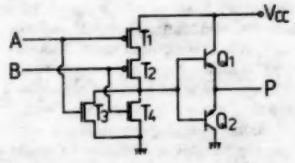
comparator means for comparing the voltage levels of said input signal and said reference voltage.

4,965,470

HIGH INTEGRATED BI-CMOS LOGIC CIRCUIT

Yunseung Shin, Sungnam, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Jan. 30, 1989, Ser. No. 303,183
Int. Cl.[5] H03K *19/02, 19/20*
U.S. Cl. 307—446 4 Claims



1. A high integrated Bi-CMOS logic circuit comprising:

a plurality of input terminals;

a first plurality of MOS transistors having drain-source current paths connected in series between a first supply voltage terminal and an intermediate node, said first MOS transistors each having a gate connected to a corresponding one of said input terminals;

a second plurality of MOS transistors having drain-source current paths connected in parallel between said intermediate node and a second supply voltage terminal, said second MOS transistor each having a gate connected to a corresponding one of said input terminals;

a first bipolar transistor having an emitter-collector current path connected between the first supply voltage terminal and an output terminal; and

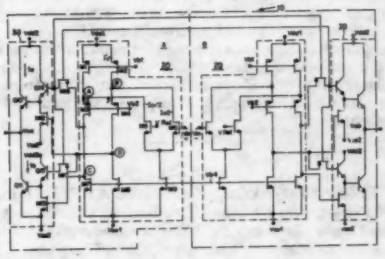
a second bipolar transistor having an emitter-collector current path connected between the second supply voltage terminal and said output terminal, said first and second bipolar transistors each having a base connected to said intermediate node.

4,965,471

BI-CMOS CLOCK DRIVER WITH REDUCED CROSSOVER CURRENT

Michael J. Gaboury, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 26, 1989, Ser. No. 371,164
Int. Cl.[5] H03K *19/02, 19/088, 5/12*
U.S. Cl. 307—446 5 Claims



1. A BiCMOS clock driver circuit with reduced crossover current comprising:

(a) a pair of amplifiers for receiving a differential input signal and for providing two pairs of complemented output signals;

(b) sensing means including two pairs of sense transistors each one of the sense transistors of an associated pair connected to receive one of the a pair of complemented output signals from an associated one of said pair of amplifiers; and

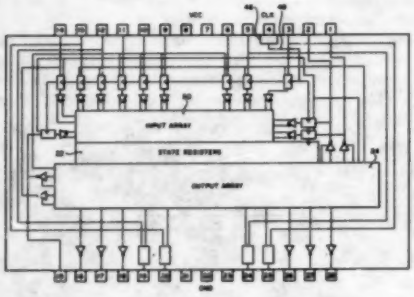
(c) output means including a pair of bipolar output stages each comprised of: a first pair of NPN transistors, serially connected to a source of potential, with the emitter of one transistor of each respective pair being connected to the collector of the other transistor to form an output connection, a second pair of NPN transistors each having an emitter connected to the bases of respective ones of said first pair of NPN transistors and with each of their collectors connectable to a source of potential and each of their bases coupled to said pair of amplifiers by a respective sense transistor so as to receive said complemented output signals.

4,965,472

PROGRAMMABLE HIGH SPEED STATE MACHINE WITH SEQUENCING CAPABILITIES

Robert E. Anderson, Beaverton, Oreg., assignor to Cypress Semiconductor Corp., San Jose, Calif.

Filed Aug. 11, 1988, Ser. No. 231,229
Int. Cl.[5] H03K *19/177*
U.S. Cl. 307—465 8 Claims



1. A programmable state machine comprising:

a plurality of clocked macrocells, each having a state register, said macrocells having a cascade input and a cascade output, said cascade output being responsive to the state of said state register in the respective said macrocell, said macrocells having the cascade output of one macrocell coupled to the cascade input of the next macrocell, each of said macrocells being programmably responsive to a condition input and the cascade input to control the state transitions of the state register therein;

a programmable input array coupled to said macrocells for logically combining state machine inputs to provide said condition inputs to said macrocell; and,

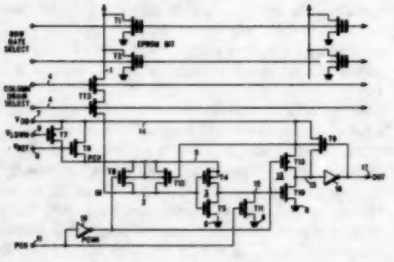
a programmable output array coupled to said macrocells and responsive to the state of said state register in each said macrocell to provide state machine outputs responsive to the state machine inputs and the programming of said state machine.

4,965,473

EPROM LOW VOLTAGE SENSE AMPLIFIER

Pascal Peguet, Ville-La-Grand; Eric Boulian, Grand-Lancy, and Jean-Claude Tarbouriech, Ville-La-Grand, all of France, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 18, 1989, Ser. No. 381,354
Claims priority, application United Kingdom, Jul. 23, 1988, 8817608
Int. Cl.[5] H03K *5/153*
U.S. Cl. 307—530 8 Claims



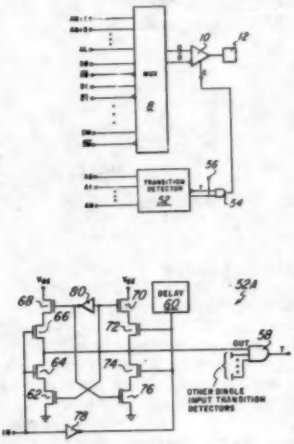
1. A low voltage sense amplifier for an EPROM memory transistor comprising a low voltage inverter having an input selectively couplable to the EPROM memory transistor and an output; means for applying a selectable reference voltage as a supply voltage for the inverter and means responsive to a precharge signal for coupling the selectable reference voltage, as a precharge voltage, to the input of the low voltage inverter.

4,965,474

GLITCH SUPPRESSION CIRCUIT

Jimmie D. Childers, Missouri City, and Roger D. Norwood, Sugarland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 245,197, Sep. 16, 1988, abandoned. This application Feb. 26, 1990, Ser. No. 486,621
Int. Cl.[5] H03K *17/04, 17/687, 19/096, 5/153*
U.S. Cl. 307—542 10 Claims



1. A circuit for preventing timing glitches in the output of a memory device of the type having a plurality of addressable storage cells comprising:

decode circuitry coupled to receive digital address information for outputting a first signal from one of the storage cells;

an output buffer, including terminals for connection to a supply voltage and a reference voltage, coupled to the decode circuitry to provide a second signal indicative of the first signal at an output terminal, said buffer including:

an N-channel pull-up transistor connected for conduction between the supply voltage terminal and said output terminal to render the output signal logic-high when the first signal is indicative of a logic-high stage; and

an N-channel pull-down transistor connected for conduction between said output terminal and the reference terminal to render the output signal logic-low when the first signal is indicative of a logic-low state;

booster circuitry connected between the decode circuitry and an input to the pull-up transistor, said booster circuitry including a charging capacitor for providing sufficient voltage to the pull-up transistor to render the output signal logic-high when the first signal changes from a logic-low state to a logic-high state;

detection circuitry providing a transition signal indicative of a change in a portion of the address information; and

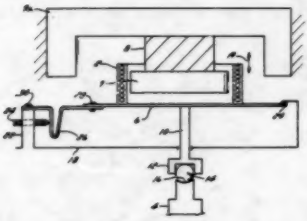
logic circuitry responsive to the transition signal for discharging the capacitor each time said portion of address information transitions to a different digital state.

4,965,475

OFFSET ADJUST FOR MOVING COIL TRANSDUCER

Thomas O. Kautz, Mequon, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Jul. 19, 1989, Ser. No. 381,812
Int. Cl.[5] H02K 7/04; F16K 31/10; G05D 16/02
U.S. Cl. 310—13 14 Claims



1. A coil offset adjusting mechanism for an electropneumatic transducer, comprising:

a coil suspension means for supporting a coil;

a lever supporting one end of the coil suspension means;

an offset adjusting spring supporting the other end of the suspension means, the spring having a fold therein; and

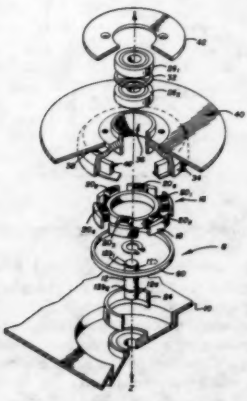
an adjusting means for pushing the sides of said fold together when moved in one direction and removing compressive pressure on the sides of said fold when moved in an opposite direction, thereby flexing said suspension means and adjusting the offset of said coil.

4,965,476

STABILIZED DISK DRIVE SPIN MOTOR

Joseph T. Lin, Cupertino, Calif., assignor to Conner Peripherals, Inc., San Jose, Calif.

Filed Apr. 20, 1989, Ser. No. 341,070
Int. Cl.[5] H02K 5/24, 5/00, 21/12
U.S. Cl. 310—51 11 Claims



6. An under-the-hub spin motor for rotating a disk in a disk drive, the disk having a mounting hole having a diameter, comprising:

a base;

a shaft having a first portion, a second portion, and a cylindrical axis, said first portion being mounted to the base;

a hub assembly, comprising:

a hub including a bearing contact surface having a second diameter, and a disk support surface which is perpendicular to the cylindrical axis of said shaft, and

a rotor mounted on said hub, said hub assembly having a center of mass;

first and second bearings rotatably supported said hub assembly on said second portion of said shaft so that said rotor is cantilevered with respect to the axial region between the first and second bearings and so that the center of mass of said hub assembly is positioned at a point on the cylindrical axis of said shaft between said first and second bearings;

a stator assembly provided on the base plate so that said rotor is concentric with said stator assembly, said stator assembly having an outer diameter greater than the diameter of the mounting hole in the disk; and

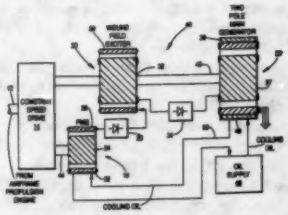
a stabilizer ring contacting said outer diameter of said stator assembly, said stabilizer ring being formed integrally with said base plate.

4,965,477

INTEGRATED DRIVE GENERATOR WITH PERMANENT MAGNET GENERATOR ON SECOND SHAFT

Jeffrey A. Stadler, and Wayne A. Flygare, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 17, 1989, Ser. No. 324,755
Int. Cl.[5] H02K 19/26, 16/00, 23/60, 7/20
U.S. Cl. 310—114 33 Claims



1. An integrated drive generator for generating constant frequency alternating current which is driven by a drive shaft at variable rotational speeds comprising:

a constant speed drive including a differential having an input coupled to the drive shaft and a first side of the differential and at least one output coupled to the first side of the differential which rotates at a fixed rotational velocity in response to the drive shaft rotating at a variable velocity and which drives a first drive shaft at a fixed rotational velocity and a second drive shaft at a fixed rotational velocity;

an alternating current generator having a rotor mounted on the first shaft for generating the constant frequency alternating current;

an exciter having a rotor mounted on the first shaft, electrically coupled to a field winding of the alternator, for supplying electrical power to the field winding; and

a generator, having a rotor mounted on the second shaft, electrically coupled to the exciter, for supplying electrical power to a field winding of the exciter.

4,965,478
DC MOTOR WITH A DURABLE PIGTAIL ARRANGEMENT

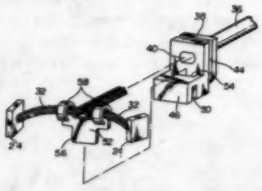
Kouji Kobayashi, Nitta; Hideyuki Minami, Kiryu, and Shinichi Nagashima, Ashikaga, all of Japan, assignors to Mitsuba Electric Mfg. Co., Ltd., Gunma, Japan

Filed Jul. 25, 1989, Ser. No. 385,245

Claims priority, application Japan, Sep. 2, 1988, 63-115639 [U]; Sep. 5, 1988, 63-116562 [U]; Sep. 5, 1988, 63-116563 [U]; Sep. 20, 1988, 63-123193[U]

Int. Cl.[5] H01R *13/52;* **H02K** *5/22, 5/24*

U.S. Cl. 310—249 **11 Claims**



1. A dc motor including: a motor case having an opening for wiring; a commutator disposed in the motor case; a first set of brushes in sliding electrical contact with the commutator; a first set of pigtails, extending respectively from the first set of brushes, for electrically connecting the first set of brushes to stationary terminals, the first set of pigtails passing out of the motor case through the opening in the motor case; and an insulating member fixedly fitting in the opening of the motor case so as to fill a gap between the motor case and the first set of pigtails as well as to insulate the first set of pigtails from the motor case, wherein the improvement comprises:

securing means fixing the first set of pigtails to the insulating member, the securing means comprising: first means stationarily engaged with the insulating member; and second means fixedly connected to those portions of the first set of pigtails inside the motor case;

wherein the second means comprises a plurality of tabs firmly holding said portions of the first set of pigtails, respectively;

wherein the insulating member has inner and outer faces, the inner face facing the inside of the motor case, the outer face being exposed to the external atmosphere, wherein the insulating member further has a projection formed on its inner face, the projection being formed with a pocket extending generally parallel to the axis of the commutator, and wherein the first means comprises a tail portion unitarily formed with the tabs, the tail portion fitting in the pocket of the projection and engaging with the projection.

4,965,479
SURFACE TRANSVERSE WAVE RESONATOR

Scott S. Elliott; Robert C. Bray, both of Santa Rosa; Timothy L. Bagwell, Robert Park, and Peter S. Cross, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 387,431, Jul. 27, 1989, abandoned, which is a continuation of Ser. No. 262,207, Oct. 19, 1988, abandoned, which is a continuation of Ser. No. 1,948, Jan. 12, 1987, abandoned. This application Mar. 29, 1990, Ser. No. 504,065

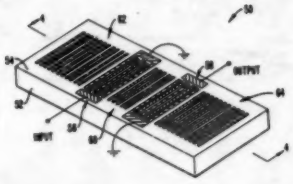
Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—313 D **21 Claims**

1. A method for operating a surface elastic wave device to provide a surface skimming bulk wave device in the form of a surface transverse wave resonator, comprising:

providing a piezoelectric substrate having at least one surface, wherein said substrate includes a crystalline structure that permits the propagation of transverse waves;

providing at least one set of transducing periodic perturbations which are in contact with said substrate surface, said at least one set of transducing periodic perturbations having first and second edges substantially perpendicular to the direction of propagation of said transverse waves, wherein said one set of transducing perturbations transduces electromagnetic energy from an external source into acoustic waves including said transverse waves; and



confining said transverse waves adjacent to said substrate surface and reflecting said transverse waves by providing at least two sets of surface-trapping and reflecting periodic perturbations substantially perpendicular to the direction of propagation of said transverse waves, at least one of said sets of reflecting periodic perturbations being disposed opposite each of said respective edges of said at least one set of transducing periodic perturbations.

4,965,480
SURFACE ACOUSTIC WAVE CONVOLVER WITH TWO OUTPUT ELECTRODES OF DIFFERENT LENGTHS

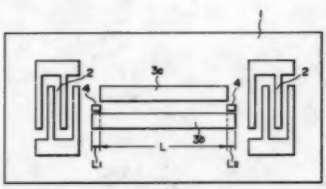
Norihiro Mochizuki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1988, Ser. No. 292,241

Claims priority, application Japan, Jan. 12, 1988, 63-3211

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—313 D **6 Claims**



1. A surface acoustic wave convolver comprising:

a piezoelectric substrate;

plural input transducers formed on said substrate and adapted for respectively generating surface acoustic waves corresponding to input signals; and

an output transducer for obtaining a convolution signal of said input signals from a surface acoustic wave generated by non-linear interaction of the surface acoustic waves generated by said input transducers;

wherein said output transducer is formed by first and second output electrodes provided in parallel manner between said input transducers and having mutually different lengths along the propagating direction of said surface acoustic wave; and

wherein the difference ΔL in length of said first and second output electrodes substantially satisfies following condition:

$$\Delta L \cdot (1/v_m - 1/v_0) = (n+\tfrac{1}{2}) \cdot 1/f$$

wherein V_m is the velocity of the surface acoustic wave on the substrate surface covered with said output electrode, V_0 is the velocity of the surface acoustic wave on the free surface of the substrate not covered by said output electrode, f is the center frequency of said input signals, and n is an integer.

4,965,481

DRIVE CIRCUIT FOR VIBRATORY-WAVE MOTOR

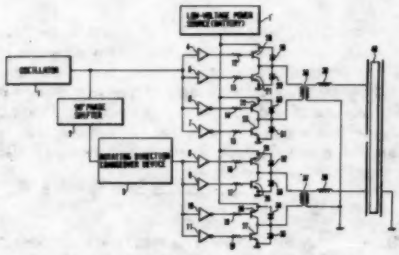
Ritsuo Kashiyama, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 254,854, Oct. 7, 1988, abandoned. This application May 22, 1989, Ser. No. 355,834

Claims priority, application Japan, Oct. 20, 1987, 62-265705

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—316 15 Claims



1. A drive circuit for a vibratory-wave motor which produces a driving force of a progressive vibratory wave formed by applying frequency voltages of different phases respectively to a first electro-mechanical energy conversion element portion arranged at a first position on a first member and a second electro-mechanical energy conversion element portion arranged at a second position on the first member, said drive circuit comprising:

(a) a frequency signal forming circuit for forming a frequency signal of a predetermined period;

(b) a shifting circuit for outputting a frequency signal shifted by a predetermined phase from the frequency signal output from said frequency signal forming circuit;

(c) a first transformer for boosting an output of a power source circuit, an output of said first transformer serving as the frequency voltage applied to the first conversion element portion;

(d) a second transformer for boosting the output of said power source circuit, an output of said second transformer serving as the frequency voltage applied to the second conversion element portion;

(e) a first current supply control circuit responsive to the frequency signal output from said frequency signal forming circuit for alternately forming first and second current paths, the first current path connecting a first terminal of a primary coil of said first transformer to a first output terminal of said power source circuit and connecting a second terminal of said primary coil of said first transformer to a second output terminal of said power source circuit to allow a current to flow from said first terminal to said second terminal of said primary coil of said first transformer, and the second current path connecting said first terminal of said primary coil of said first transformer to said second output terminal of said power source circuit and connecting said second terminal of said primary coil of said first transformer to said first output terminal of said power source circuit to allow a current to flow from said second terminal to said first terminal of said primary coil of said first transformer; and

(f) a second current supply control circuit responsive to the frequency signal output from said shifting circuit for alternately forming first and second current paths, the first current path of said second current supply control circuit connecting a first terminal of a primary coil of said second transformer to said first output terminal of said power source circuit and connecting a second terminal of said primary coil of said second transformer to said second output terminal of said power source circuit to allow a current to flow from said first terminal to said second terminal of said primary coil of said second transformer, and the second current path of said second current supply control circuit connecting said first terminal of said primary coil of said second transformer to said second output terminal of said power source circuit and connecting said second terminal of said primary coil of said second transformer to said first output terminal of said power source circuit to allow a current to flow from said second terminal to said first terminal of said primary coil of said second transformer.

4,965,482

ULTRASONIC MOTOR AND METHOD OF ADJUSTING THE SAME

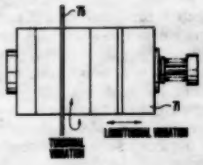
Osamu Ohnishi; Sadayuki Takahashi; Osamu Myohgu; Tadao Uchikawa; Takeshi Inoue; Isao Kagaya, and Sadayuki Ueha, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jun. 14, 1989, Ser. No. 365,897

Claims priority, application Japan, Jun. 17, 1988, 63-149726; Jun. 29, 1988, 63-164033; Aug. 11, 1988, 63-201605; Feb. 28, 1989, 1-48860

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—323 17 Claims



1. An ultrasonic motor comprising:

a longitudinal-torsional composite transducer;

a stator including an ultrasonic vibrator sandwiching said transducer;

a rotor urged against said stator for causing said stator to excite longitudinal-torsional ultrasonic vibrations and for rotating said rotor by a frictional force; and

adjusting means for matching resonance frequencies of longitudinal and torsional ultrasonic vibrations of said stator with each other;

wherein said adjusting means comprises pressure adjusting means for adjusting the pressure of urging said rotor against said stator.

4,965,483

PIEZOELECTRIC BUZZER

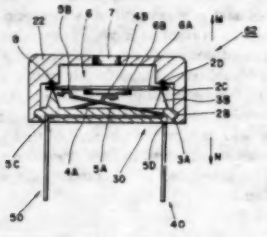
Toshio Abe; Seiichi Takahashi; Masaharu Kamihara; Hitoshi Saito; Seizo Tanaka, and Yasuyuki Suzuki, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Mar. 13, 1989, Ser. No. 322,580

Claims priority, application Japan, Mar. 17, 1988, 63-35949 [U]; Jul. 8, 1988, 63-91091 [U]; Jul. 8, 1988, 63-171574; Sep. 9, 1988, 63-119141[U]; Oct. 13, 1988, 63-134274[U]

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—324 **7 Claims**



1. A piezoelectric buzzer comprising:

a case having the shape of a bottomed cylinder with an open end,

a piezoelectric diaphragm supported within said case in spaced parallel relationship with the bottom thereof, said diaphragm consisting of a circular metal plate having a piezolelectric element of smaller area than the metal plate adhesively attached to the surface of the plate which faces the open end of the case,

a cover plate having exterior and interior surfaces sealingly fitted in the open end of said case having means on its interior surface for engaging said circular metal plate for fixedly supporting said piezoelectric diaphragm within said case, and

first and second terminals each comprising an elongate elastic metal strip bent at least two spaced apart places to have a substantially straight intermediate portion, a leg extending from a first end of the intermediate portion disposed at a first angle with respect thereto and an elastic contact tongue extending from a second end of the intermediate portion disposed at an acute angle relative thereto, the intermediate portion of said first and second terminals being integrally molded within said cover plate and disposed in a common plane substantially parallel to the interior and exterior surfaces thereof and parallel to and equally spaced a predetermined distance from opposite sides of an imaginary line lying on a diameter of the cover plate, with said legs respectively projecting outwardly from the cover plate at points near opposite ends of said imaginary line, and with said elastic tongues projecting diagonally inward from the interior surface of the cover plate with the first elastically contacting said piezoelectric element and the second elastically contacting said metallic plate.

4,965,484

VAPOR DISCHARGE LAMP WITH GRADIENT TEMPERATURE CONTROL

Michael E. Fein, Mountain View, Calif., assignor to Tencor Instruments, Mountain View, Calif.

Filed Mar. 10, 1989, Ser. No. 322,080

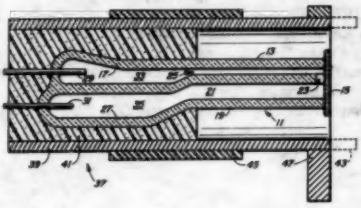
Int. Cl.[5] H01J *61/30, 61/20, 61/52*

U.S. Cl. 313—15 **24 Claims**

1. An end-viewed vapor discharge lamp comprising,

a lamp envelope containing a volume of excitatable vapor, said envelope having a small bore capillary tube and a transparent planar window on one end of said capillary tube, said capillary tube and said window together defining an output end of said envelope, said window defining a light emitting surface region of said envelope, said envelope further including a base portion of said envelope distal to said output end, said base portion having a larger bore than said capillary tube and in communication with said capillary tube,

means for producing an electrical discharge in said small



bore capillary tube, whereby said vapor is excited to produce light for emission through said window, and

differential temperature control means positioned around said envelope for maintaining a higher temperature in a first portion of said volume proximate to said light emitting surface region than in at least one other volume portion within said envelope, whereby condensation of vapor on said window is prevented.

4,965,485

HALOGEN LAMP ENVELOPE WITH ROUGHENED SURFACE AREA AND OPTICAL FILM

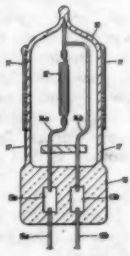
Kazuo Tarumi, and Tsutomu Watanabe, both of Yokosuka, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 9, 1988, Ser. No. 281,856

Claims priority, application Japan, Feb. 10, 1988, 63-27670

Int. Cl.[5] H01J *5/16*

U.S. Cl. 313—43 **7 Claims**



1. A halogen lamp, comprising:

a translucent glass envelope having a halogen-containing gas sealed therein, the envelope including an outer surface and a connection end;

a filament sealed within the envelope for generating light, including visible light and infrared rays:

lead-in means for connecting the lamp to a source of electricity;

metal foil embedded within the connection end of the envelope for electrically connecting the filament to the lead-in means, and

an optical film on a portion of the envelope for reflecting the infrared rays and transmitting the visible light, the reflected infrared rays generating heat within the envelope which is transmitted by conduction through the envelope,

the envelope aLSO including roughened area means free from the optical film means on the outer surface between the optical film means and the connection end for interrupting the transmission of the heat through the envelope to the metal foil means.

4,965,486

ELECTRON GUN DESIGN USING A LANTHANUM HEXABORIDE CATHODE

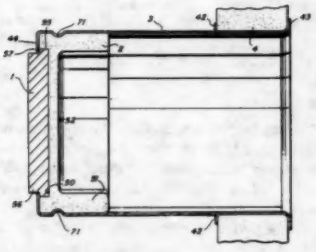
Hans J. Kolpin, White Lake, Canada, assignor to Atomic Energy of Canada Limited, Otawa, Canada

Filed Oct. 26, 1988, Ser. No. 263,026

Claims priority, application Canada, Nov. 12, 1987, 551681

Int. Cl.[5] H01J *1/14, 19/12*

U.S. Cl. 313—270 **7 Claims**



1. A structure for supporting an LaB_6 electron emission disc within a hot cathode assembly of an electron gun, comprising a mounting member having a recess partly receiving snugly the LaB_6 disc, the disc and mounting member being received within a metal cathode tube and secured thereto by means of a radially inwardly extending lip formed at one end of the cathode tube and overlapping a portion of the disc and by means of indentations formed in the tube and extending into the mounting member.

4,965,487

FLAT CATHODE RAY TUBE DISPLAY APPARATUS

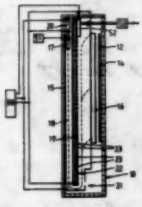
Kenneth G. Freeman, Reigate, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1989, Ser. No. 322,746

Claims priority, application United Kingdom, Mar. 23, 1988, 8806918

Int. Cl.[5] H01J *29/70*; G09G *1/04*

U.S. Cl. 313—422 **14 Claims**



1. A flat cathode ray tube apparatus comprising a cathode ray tube having an envelope, a luminescent screen extending over a substantially flat faceplate, means in the envelope for producing and directing an electron beam substantially parallel to the faceplate, and a deflection electrode array within the envelope and operable by a drive circuit for deflecting the beam in a direction towards said faceplate in field scanning manner, characterised in that the deflection electrode array comprises a plurality of deflector electrodes which are switched successively between two selected voltage levels in each field period to produce deflection fields with at least one of the selected voltage levels being different in alternate fields whereby in one field period one set of display lines is produced on the screen and in the successive field period a second set of display lines interlaced with the first set is produced.

4,965,488

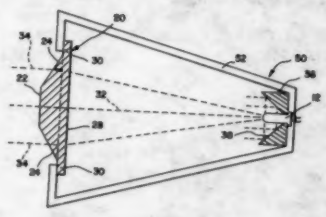
LIGHT-SOURCE MULTIPLICATION DEVICE

Bachir Hibi, 1888 Peeler Rd., Dunwoody, Ga. 30338

Filed Mar. 27, 1989, Ser. No. 328,639

Int. Cl.[5] H01L *33/00*

U.S. Cl. 313—499 **14 Claims**



1. A light-source multiplication device comprising:

(a) a light transmissive element including one substantially planar face and an opposite face with multiple facets; and

(b) a light emitting diode for generating light; said diode being spaced from said element such as to direct light towards said planar face wherein the facets on said light transmissive element are angled such that images of light from said light emitting diode project in parallel from each facet.

4,965,489

ELECTRON GUN FOR CATHODE-RAY TUBE

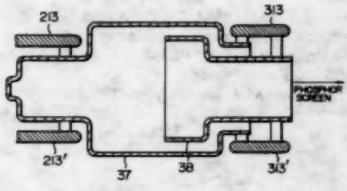
Shoji Shirai, Mobara; Masaaki Yamauchi, Togane, and Yasuo Tanaka, Ichihara, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Device Engineering Co., Ltd., Mobara, both of, Japan

Filed Apr. 7, 1989, Ser. No. 334,342

Claims priority, application Japan, Apr. 8, 1988, 63-85077

Int. Cl.[5] H01J *29/62*

U.S. Cl. 313—449 **8 Claims**



1. An electron gun for a cathode-ray tube, comprising:

electron-beam generating means for generating an electron beam and emitting said electron beam toward a phosphor screen;

a principal lens for focusing said electron beam on said phosphor screen;

said principal lens constituted by at least one set of electrodes, one electrode being a focusing electrode to which a low potential is given with the other electrode being an accelerating electrode to which a high potential is given;

said focusing electrode having an enlarged-diameter portion at its axial middle portion and reduced-diameter portions at its respective opposite end portions; and

said accelerating electrode having opposite end portions, one of which is larger in diameter than the other, said one end portion being located in said enlarged-diameter portion of said focusing electrode with said other end portion inserted through one of said reduced-diameter portions of said focusing electrode, said other end portion and said one of said reduced-diameter portions being supported in a mutually insulated relationship by an electrode supporting rod.

4,965,490

SCENT-GENERATING LAMP USING MATING PARTS

Elizabeth L. Ratner, Lowell, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Jan. 9, 1989, Ser. No. 295,091

Int. Cl.[5] H01K *1/28, 7/00*; A62B *7/08*

U.S. Cl. 313—569 **13 Claims**

1. A vapor-generating electric lamp comprising:

a sealed, light-transmissive lamp envelope having a concave depression therein;

an incandescent filament mounted within said lamp envelope;

a base for mounting of said lamp and for interconnection of the filament to a source of electrical energy; and

a replaceable, solid insert disposed in said concave depression, said insert producing a vapor when warmed by heat from said filament and being of a material that can withstand the operating temperature of said lamp envelope, said insert comprising only a molded polymer impregnated with a vaporizable material and including a convex portion that substantially matches said depression in shape.

4,965,491

PLASMA GENERATOR

Jacques Menet, Saint Egreve, and Vincent Comparat, Grenoble, both of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Mar. 25, 1987, Ser. No. 30,026

Claims priority, application France, Mar. 26, 1986, 86 04725

Int. Cl.[5] H01J *1/00*

U.S. Cl. 315—111.21 **10 Claims**

1. A plasma generator comprising a chamber at a first potential (V1) filled with a low pressure gas to be ionized, said chamber having mounted therein an electrode at a second potential (V2) higher than the first potential by a quantity larger than the ionization threshold of the gas to be ionized, wherein said electrode comprises a generally planar equipotential surface transparent to ions and electrons, whereby ions and electrons passing therethrough from one side of said surface to the other are subjected to said V2/V1 potential difference.

4,965,492

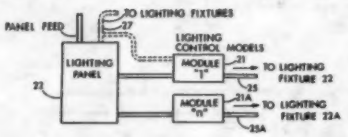
LIGHTING CONTROL SYSTEM AND MODULE

Scott L. Boldwyn, McHenry, Ill., assignor to Energy Technology, Inc., Hofman Estates, Ill.

Filed Nov. 18, 1988, Ser. No. 273,055

Int. Cl.[5] H05B *37/02, 39/02*; G05F *1/00*; G01J *1/20*

U.S. Cl. 315—156 **4 Claims**



1. A control module for controlling the power provided to a lighting fixture load from an alternating current source comprising in combination, (a) means for determining a first power level regardless of the phase angle between the volage and current that has to be applied to the connected lighting fixture load to provide a given lighting level, (b) said mean for determining said first power level including, (c) means for sensing at spaced periodic points the instantaneous current flowing to said lighting fixture load, said periodic points being related to a reference half cycle of a voltage sine wave and (d) means for multiplying said instantaneous current by a factor representing an instantaneous voltage factor at the current sensing point to provide an instantaneous power resultant, (e) means for selecting a second power level which is a percentage of said first power level which will be provided to said lighting fixture load to effect a selected lighting level which is less than said given lighting level, and (f) means for controlling said second power level provided to said lighting fixture load in accordance with said selected lighting level, said means for controlling said second power level means including (g) means for combining and averaging a selected number of resultants to obtain a factor representing the average of said second power level provided to the lighting fixture load.

4,965,493

ELECTRIC ARRANGEMENT FOR IGNITING AND SUPPLYING A GAS DISCHARGE LAMP

Johannes M. Van Meurs, and Machiel A. M. Hendrix, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 29, 1988, Ser. No. 251,628

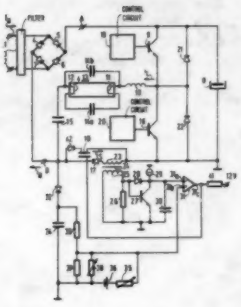
Claims priority, application Netherlands, Oct. 7, 1987, 8702383

Int. Cl.[5] H05B *37/02*

U.S. Cl. 315—224 **11 Claims**

1. An electric arrangement for igniting and supplying a gas discharge lamp comprising: two input terminals for an AC power supply source, a rectifier bridge connected to the input terminals and having output terminals connected to a DC/AC converter having two input terminals, one terminal of which is connected to the other terminal via a series arrangement of a first semiconductor switching element and a load circuit comprising at least an induction coil and the discharge lamp as well as a capacitor, said load circuit and capacitor being shunted by a circuit comprising a second semiconductor switching element and a third semiconductor switching element, the first and second semiconductor switching elements being shunted by a buffer capacitor, characterized in that the third semicon-

ductor switching element includes a control circuit rendering the third switching element conductive for a given period at



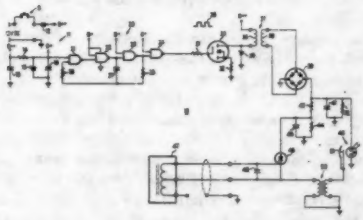
the start of each period of the high-frequency cycle of the converter.

4,965,494

CAPACITOR CHARGING CIRCUIT FOR TIMING LIGHT POWER SOURCE

Leonard J. Wisneski, Jr., Kenosha, and Gordon Lindhard, Racine, both of Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed Oct. 21, 1985, Ser. No. 789,474
Int. Cl.[5] H05B *41/34*
U.S. Cl. 315—241 S **15 Claims**



1. In a strobe light having capacitance means successively charged by a power supply through a charging circuit and discharged through a strobe lamp, the improvement comprising: active electronic switch means including a metal oxide semiconductor field effect transistor coupled to the charging circuit for controlling the input current thereto during charging of the capacitance means, oscillator means coupled to the power supply independently of the charging circuit and generating a rectangular wave output signal of a predetermined frequency, and means for coupling said rectangular wave output signal to said electronic switch means for controlling the operation thereof.

4,965,495

PARABOLIC VOLTAGE GENERATING CIRCUIT

James A. Wilber, and Lawrence E. Smith, both of Indianapolis, Ind., assignors to RCA Licensing Corporation, Princeton, N.J.

Filed Apr. 30, 1990, Ser. No. 516,393
Int. Cl.[5] H01J *29/56*
U.S. Cl. 315—371 **20 Claims**

1. A video apparatus for controlling a landing of an electron beam on a display screen of a cathode ray tube, comprising:

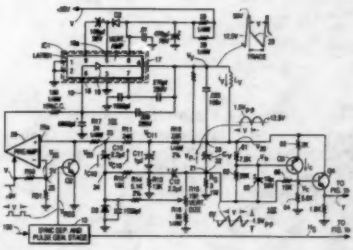
a source of an input signal at a vertical rate;

a vertical deflection winding disposed on said cathode ray tube;

an impedance for generating thereacross a deflection current indicative voltage;

a capacitor coupled in series with said deflection winding and with said impedance to form a series arrangement;

a vertical deflection amplifier responsive to said input signal and to said deflection current indicative voltage and coupled to said series arrangement for generating a vertical deflection current that flows in said series arrangement and develops first and second voltages at first and second terminals, respectively, of said capacitor that vary at said vertical rate such that a voltage difference between said first and second terminals varies in a parabolic manner at said vertical rate;



a transistor having first and second terminals that are coupled across said capacitor for generating at a third terminal of said transistor an output signal that is determined in accordance with said voltage difference;

means for developing an energizing, DC voltage between a pair of said terminals of said transistor that is coupled to said transistor via at least one of said deflection winding, said first terminal of said capacitor and said second terminal of said capacitor; and

means responsive to said output signal for applying said output signal to said cathode ray tube to control said landing of said electron beam in a manner that varies upon vertical deflection.

4,965,496

PROTECTION ARRANGEMENT OF A DEFLECTION CIRCUIT

Peter E. Haferl, Adliswil, Switzerland, assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Feb. 24, 1989, Ser. No. 315,087
Claims priority, application United Kingdom, Oct. 3, 1988, 8805757; Oct. 3, 1988, 8805758
Int. Cl.[5] H01J *29/56, 29/70*
U.S. Cl. 315—371 **18 Claims**

1. A television deflection apparatus, comprising:

a deflection resonant circuit including a deflection winding and a retrace capacitance;

a source of an input first signal at a frequency that is related to a first deflection frequency;

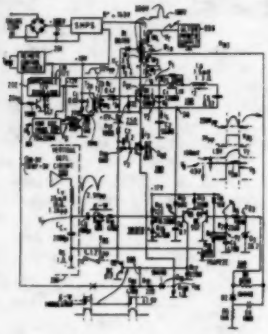
a first transistor operating as a switch and being responsive to said input first signal and being coupled to said deflection resonant circuit for generating a deflection current in said deflection winding at said first deflection frequency;

a second transistor coupled to said deflection resonant circuit and to said first transistor such that during a given deflection cycle said first and said second transistors are conductive and coupled in series;

a source of an input supply voltage coupled to said first and second transistors for generating a current that flows through both transistors when both transistors are conductive and coupled in series;

a source of a modulation second signal coupled to said sec-

ond transistor for modulating conduction thereof in accordance with said second signal; and



means for generating a control signal that is coupled to a control terminal of said second transistor for substantially reducing the flow of said current through both transistors when said first transistor is conductive.

4,965,497

CONTROL CIRCUIT FOR AN ELECTRIC DRIVE MOTOR

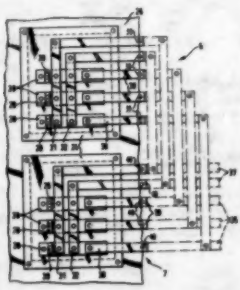
Anton Rodi, Leimen, and Michael Krüger, Edingen-Neckarhausen, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Continuation of Ser. No. 934,308, Nov. 24, 1986, abandoned. This application Apr. 29, 1988, Ser. No. 188,652

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1985, 3541275

Int. Cl.[5] H02B *1/20*

U.S. Cl. 318—372 **10 Claims**



1. Control circuit for an electric motor having a first power control element having a plurality of semiconductors for driving the motor in one torque direction, and a second power control element having a plurality of semiconductors for driving the motor in the other torque direction, comprising means for separating at least one of the first and second power control elements, upon failure of the one of the first and second power control elements, and connecting the remainder of the circuit to the other of the first and second power control elements instead of the failed one of the first and second power control elements.

4,965,498

ELECTRICALLY OPERATED SYSTEM FOR DRAWING CURTAINS AND OTHER TYPES OF BARRIERS

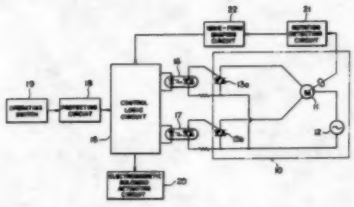
Takashi Yokota, Kanayawa, Japan, assignor to Kabushiki Kaisha Yokota, Tokyo, Japan

Filed Jun. 22, 1989, Ser. No. 370,044

Claims priority, application Japan, Nov. 10, 1988, 63-282390

Int. Cl.[5] A47H *5/00*

U.S. Cl. 318—468 **4 Claims**



1. An electrically operated drawing system for drawing and undrawing a barrier, said system comprising:

an electric motor having a rotating shaft mounted to a drive gear;

a clutch means for operatively engaging said rotating shaft with a driving pulley, said driving pulley for undrawing and drawing the barrier when operatively engaged with said rotating shaft, said clutch means comprising a first spur gear, a second spur gear, a third spur gear, a solenoid, an arm, a spring, a connector, and an electromagnetic solenoid energizing circuit, said first spur gear engageable with said drive gear and drivable by said electric motor, said second spur gear integrally connected to a shaft of said driving pulley, said third spur gear rotatably mounted to said arm and operatively engageable with said first spur gear, said solenoid operatively connected at one end thereof to said arm through said connector, said arm rotatably supported at one end thereof by said second spur gear and having a shaft loosely fitting into a cam hole of said connector at another end thereof, said spring being mounted between said connector and said solenoid for disengaging said first spur gear and said third spur gear by pulling said solenoid and pushing said arm through said connector when said solenoid is energized, said connector having a cam aperture formed therein and operatively disposed between said arm and said solenoid, and said electromagnetic solenoid energizing circuit for controlling the movement of said solenoid for operatively engaging and disengaging said first spur gear and said third spur gear by moving said arm through said connector in accordance with the movement of said solenoid;

an operating switch means for outputting an operational command signal, said operational command signal indicating an operational mode of the system;

a control means coupled to said electric motor, said clutch means, and said operating switch means, said control means for controlling said rotating shaft of said electric motor and said clutch means in accordance with said operational command signal.

4,965,499

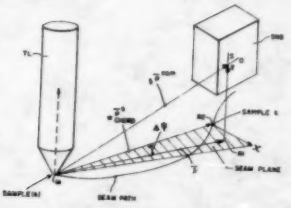
PARAMETRIC PATH MODELING FOR AN OPTICAL AUTOMATIC SEAM TRACKER AND REAL TIME ROBOTIC CONTROL SYSTEM

Jeffrey D. Taft, Plum Boro, and James F. Ellison, Monroeville, both of Pa., assignors to Westinghouse Electric Corp, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 140,261, Dec. 31, 1987, abandoned. This application Dec. 22, 1988, Ser. No. 288,651

Int. Cl.[5] G05B *19/42*

U.S. Cl. 318—568.11 **15 Claims**



1. In a robot system including a robot controller for controlling an effector end along a seam in relation to a taught path and a seam tracker control system, the seam tracker control system including a sensor system, for sensing the seam ahead of the effector end and for deriving data representing discrete successive sensed locations upon the seam, and a control processor responsive to said sensor system and to said robot controller for deriving a control signal representative of an error between effector end positioning and a matching sensed location, the effector end being controlled by said robot controller in response to said control signal to provide seam tracking with the effector end;

said seam model being responsive to said third signal for deriving a fourth signal representative of a corresponding seam location;

said comparating means being responsive to said third and fourth signals for deriving said present control signal.

4,965,500

INDUSTRIAL ROBOT CONTROL APPARATUS

Toru Mizuno, Tama; Ryuichi Hara, and Hiroji Nishi, Yamanashi, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

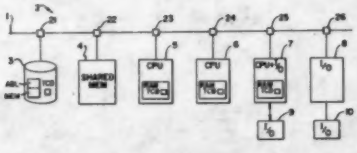
PCT No. PCT/JP88/00611, § 371 Date Feb. 17, 1989, § 102(e) Date Feb. 17, 1989, PCT Pub. No. WO88/10453, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 20, 1988, Ser. No. 350,471

Claims priority, application Japan, Jun. 19, 1987, 62-151422

Int. Cl.[5] G05B *19/42*

U.S. Cl. 318—568.13 **2 Claims**



1. An industrial robot control apparatus for share-controlling an industrial robot, comprising:

a plurality of arithmetic and control units connected to each other through a common bus and for sharing control of the industrial robot, each of said arithmetic and control units having a volatile memory;

an external storage unit, connected to said plurality of arithmetic and control units through said common bus, for storing an plurality of assigned operating systems and a plurality of assigned tasks which are assigned to each said arithmetic and control units, for storing a plurality of unassigned tasks which can be operated in any of said arithmetic and control units, for storing management data which defines memory capabilities of said plurality of arithmetic and control units and which loads said assigned and unassigned tasks, and for storing synchronization control data which indicates which arithmetic and control units stores said tasks; and

a shared memory connected to said plurality of arithmetic and control units and said external storage unit through said common bus,

each of said plurality of arithmetic and control units loading into its own volatile memory by using an initial loader operated in response to an energization of a power source,

a specified one of said plurality of arithmetic and control units loading said management data and synchronization control data from said external storage unit into said shared memory,

each of said plurality of arithmetic and control units loading one of said assigned operating systems and some of said assigned tasks thereto into its own volatile memory while establishing a synchronization with other arithmetic and control units in accordance with synchronization control data stored in said shared memory;

each of said plurality of arithmetic and control units sequentially loading some of said unassigned tasks from said external storage unit into its own volatile memory in accordance with processing capabilities and load of said unassigned tasks defined by the management data while establishing synchronization with other arithmetic and control units in accordance with the synchronization control data stored in said shared memory,

therein controlling the industrial robot under a shared control of said arithmetic and control units by establishing a synchronization with each other.

4,965,501

SERVO CIRCUIT

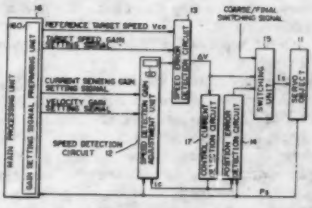
Shuichi Hashimoto, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 30, 1990, Ser. No. 472,636

Claims priority, application Japan, Jan. 30, 1989, 01-017774

Int. Cl.[5] G05B *13/00*

U.S. Cl. 318—595 **5 Claims**



1. A servo circuit for controlling the positioning of a servo object under servo control to a target position by changing from speed control affording coarse control to position control in the vicinity of the target position, comprising:

speed detection means for detecting a real speed based on a position signal transferred from the servo object;

speed error detection means for generating a speed error signal representing a difference between a target speed and the real speed;

position error detection means for generating a position error signal based on the position signal;

switching means for switching the connection of the servo object to the speed error detection means or the position error detection means and supplying a control current to the servo object;

control current detection means for detecting the control current and generating a current sensing signal; and

main processing means for generating and supplying a coarse/fine switching signal to the switching means and controlling the servo object from the coarse, speed control to the position control, said main processing means further comprising gain setting signal preparing means for gener-

sting a target speed gain setting signal, a current sensing gain setting signal, and a velocity gain setting signal, and for setting detection gains of each of said gain setting signals at a stage of acceleration control so as to increase in accordance with a decrease of a remaining amount of seek operation corresponding to a remaining number of the tracks, and said main processing means supplying the target speed gain setting signal and reference target speed signal to the speed error detection circuit, and supplying the current sensing gain setting signal and velocity gain setting signal to the speed detection means,

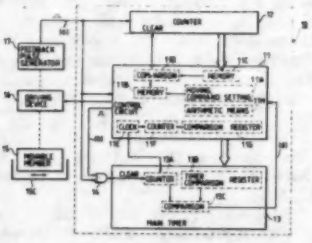
said speed detection means further comprises a speed detection gain adjustment unit for performing control to vary the detection gains of the velocity and current sensing gain setting signals.

4,965,502

DRIVE CONTROLLING APPARATUS

Akira Ogasawara, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed May 26, 1989, Ser. No. 357,726
Claims priority, application Japan, May 31, 1988, 63-133191
Int. Cl.[5] G05B *11/01*
U.S. Cl. 318—628 **6 Claims**



1. A driver controlling apparatus for controlling movement of a movable member having a mechanically limited range of movement, comprising:

drive means for supplying power to a motor to move said movable member;

feedback pulse generating means for detecting the movement of said movable member and for serially outputting a number of pulse signals corresponding to an amount of the movment of said movable member;

main timer means responsive to said pulse signals for successively measuring time periods between successive pulse signals, comparing the measured time period with a comparison level and outputting a signal when said measured time period has a predetermined relationship with said comparison level;

sub time means for measuring a time period from the start of said drive means, and for changing the value of said comparison level when the time period measured by said sub timer means is equal to a predetermined time period; and

control means for causing said drive means to stop supplying power to said motor in response to said signal from said main time means.

4,965,503

POSITIONAL INFORMATION GENERATING APPARATUS AND CODE MEANS THEREFOR

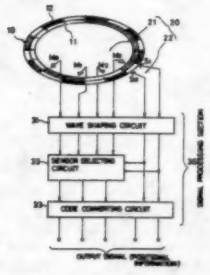
Tsuneo Watanabe, and Kouzou Okada, both of Yokohama, Japan, assignors to Tokyo Keiki Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1989, Ser. No. 328,013
Claims priority, application Japan, Mar. 23, 1988, 63-068509
Int. Cl.[5] G05B *11/01*
U.S. Cl. 318—671 **9 Claims**

1. A positional information generating apparatus including code means having a main track with M-sequence codes forming a chain of different code words and sensor means disposed for attaining relative movement with reference to a direction of the main track whereby a code word is detected from the main track by the sensor means for generating positional information, which apparatus comprises:

a sensor array for the main track in which a number of sensors, greater than the number of code elements forming one code word, are disposed over a span corresponding to a length of one code word, at least one sensor located on each code element to define a code word to be read;

a relative position detecting means for detecting a relative



positional relationship between the sensor array for the main track and the main track and producing a detection signal; and

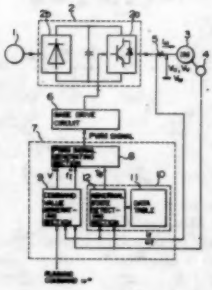
a sensor selecting circuit means for selecting a sensor for each code element from the sensor array for the main track, in response to said detection signal from the relative position detecting means, said sensor selecting circuit comprising means for conveying a signal from each selected sensor to define the detected code word.

4,965,504

CONTROL APPARATUS FOR INVERTER FOR DRIVING AC MOTOR

Shigeta Ueda, Hitachi; Kazuo Honda, Hitachiota; Takashi Ikimi, Hitachi; Toshihiko Matsuda, Hitachi; Hiroshi Nagase, Hitachi, and Nobuyoshi Mutoh, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 13, 1989, Ser. No. 406,516
Claims priority, application Japan, Sep. 20, 1988, 63-233619
Int. Cl.[5] H02P *7/42*
U.S. Cl. 318—802 **22 Claims**



1. A control apparatus for controlling a PWM inverter, said PWM inverter receiving AC power and generating an AC output having a controlled frequency to be supplied to an AC motor, said control apparatus comprising:

first means for generating, on the basis of a given running command, a PWM signal controlling said inverter with a given sampling period; and

second means for controlling said first means, whereby said AC motor generates an electromagnetic tone preselected so as to correspond to desired information when said AC motor is driven by output of said inverter controlled by said PWM signal.

4,965,505

LITHIUM BATTERY DEACTIVATOR

Frank D. McCaleb, Loxahatchee, and Basil Pagones, Fort Lauderdale, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 20, 1989, Ser. No. 340,636
Int. Cl.[5] H02J 7/00; H01M 6/00, 6/20
U.S. Cl. 320—13 **5 Claims**

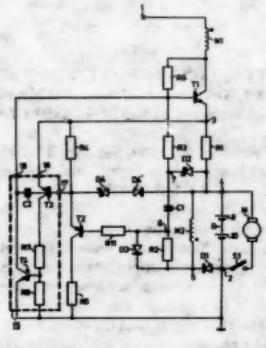
1. A Lithium battery, comprising:
at least one Lithium cell;
discharge means for discharging said at least one Lithium cell;
switch means operable to couple said discharge means to said at least one Lithium cell, such that the Lithium may be inactivated for safe disposal said Lithium battery;
means for sensing a predetermined voltage level of said Lithium battery; and
means for activating said switch means in response to sensing said predetermined voltage level to discharge said battery.

4,965,506

POWER-SUPPLY CIRCUIT HAVING CIRCUITRY FOR SWITCHING FROM A BATTERY CHARGING MODE TO A BATTERY TRICKLE-CHARGING MODE

Johannes E. Algra, and Gerrit Brouwer, both of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 25, 1989, Ser. No. 412,075
Claims priority, application Netherlands, Feb. 14, 1989, 8900360
Int. Cl.[5] H02J 7/10
U.S. Cl. 320—23 **36 Claims**



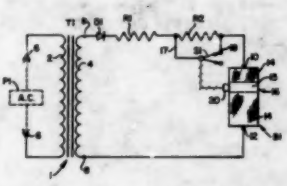
1. A power-supply circuit for charging a battery with a charging current, said power-supply circuit comprising, between a first and a second power supply terminal, a first series arrangement of a primary winding of a transformer, a first transistor switch having a control input, and a first resistor, and a second series arrangement of a secondary winding of the transformer and a first diode, said second series arrangement comprising terminals for connecting a battery; a positive-feedback path between a node interconnecting the secondary winding and the first diode and the control input of the first transistor switch, said positive-feedback path comprising a series arrangement of a second resistor and a first capacitor, the terminal of the first capacitor which is remote from the second resistor being coupled to the cathode of a zener diode; first switching means for turning off the first transistor switch at a specific voltage across the first resistor, said first switching means comprising a first input coupled to that end of the first resistor which is nearest the first transistor switch, a second input coupled to that end of the first resistor remote from the first transistor switch, and an output which is coupled to the control input of the first transistor switch; and second switching means for changing over from the charging current to a trickle-charging current above a specific threshold voltage, characterized in that the anode of the zener diode is coupled to one end of the first resistor, and in that the second switching means comprises a series arrangement of a third resistor, a second transistor switch having a control input, and a fourth resistor, arranged between the first input of the first switching means and the second power supply terminal, the control input of the second transistor switch being coupled to the node between the second resistor and the first capacitor, a third diode being arranged in parallel with the second resistor.

4,965,507

BATTERY CHARGER FOR DETECTING THE CURRENT RATE OF CHARGE FOR RECHARGEABLE BATTERIES

Nicholas J. Smilanich, Rocky River, and Robert A. Sphar, Olmsted Falls, both of Ohio, assignors to Eveready Battery Company, Inc., St. Louis, Mo.

Filed Jul. 7, 1989, Ser. No. 377,370
Int. Cl.[5] H02J 7/04
U.S. Cl. 320—48 **16 Claims**



1. A battery charger system for providing least two different rates of charging currents to rechargeable batteries and for distinguishing which rechargeable battery of similar size batteries should get which rate of charge current, said battery charger system comprising a rechargeable battery having a positive terminal and a spaced-apart negative terminal for delivering power and having an indicator band disposed between said positive terminal and said negative terminal to indicate a preferred charge rate of current the rechargeable battery can accommodate; a charging device comprising current means for delivering at least two different rates of charging current; and detection means for sensing the presence and location of the indicator band on the rechargeable battery and for directing the current means to provide a specific rate of charging current to the rechargeable battery depending on the presence and location of the indicator band on the rechargeable battery.

4,965,508

POWER SUPPLY CIRCUIT HAVING CONTROLLABLE THYRISTOR NETWORK AND ADJUSTABLE VOLTAGE REGULATOR

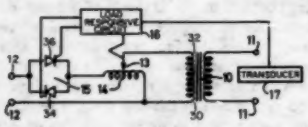
Basil Soan, Crawley, Great Britain, assignor to APV UK Limited, Great Britain

Filed Mar. 23, 1989, Ser. No. 327,528

Claims priority, application United Kingdom, Mar. 29, 1988, 8807529

Int. Cl.[5] G05F *1/253, 1/455*

U.S. Cl. 323—239 7 Claims



1. An alternating current power supply circuit for a variable electrical load comprising a power transformer having a secondary winding for connection to said load, and a primary winding connected to a main power supply via an adjustable voltage regulator,

a thyristor network in series with said adjustable voltage regulator, said thyristor network having thyristors which are arranged to be conducting for a predetermined maximum period of each cycle of said main power supply, and

a load responsive circuit arranged to provide control signals to control said adjustable voltage regulator, and switching of said thyristors in said thyristor network,

said load responsive network being arranged to adjust relatively immediately said switching of said thyristors in response to changes in said load and subsequently adjusting said adjustable voltage regulator and said thyristor switching in combination to return said thyristors to said predetermined condition.

4,965,509

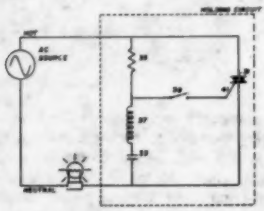
QUASI-CONSTANT GATE DRIVE CIRCUIT

David J. Oldham, Allentown, Pa., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Feb. 13, 1989, Ser. No. 310,806

Int. Cl.[5] G05F *5/02*

U.S. Cl. 323—300 41 Claims



1. An apparatus for controlling power flow an AC source to a load comprising, in combination:

(a) a thyristor, having a conductive and substantially non-conductive state,

(b) means for switching said thyristor to said conductive state during each half cycle of power flow from said AC source,

(c) means for storing energy while said thyristor is in said non-conductive state, and

(d) means for supplying said stored energy to a control terminal of said thyristor while said thyristor is in said conductive state to maintain said thyristor in said conductive state until the completion of each half cycle.

4,965,510

INTEGRATED SEMICONDUCTOR CIRCUIT

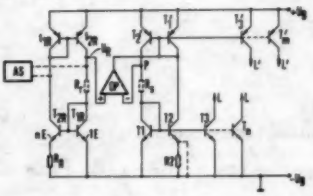
Hans Kriedt, München; Andreas Dietze, Valley-Grub, and Josef Fenk, Eching, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 806,140, Dec. 5, 1985, abandoned, which is a continuation of Ser. No. 724,942, Apr. 18, 1985, abandoned, which is a continuation of Ser. No. 416,018, Sep. 8, 1982, abandoned. This application Jan. 17, 1989, Ser. No. 298,868

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136780

Int. Cl.[5] G05F *3/16*

U.S. Cl. 323—315 1 Claim



1. Integrated semiconductor circuit, comprising a control loop including a first current source acting as an actual value transmitter for said control loop, and final control means acting on said actual value transmitter as a control, said actual value transmitter being in the form of a current mirror having a plurality of transistors each forming an output part driving a respective load element, and a second constant current source being independent of said first current source and acting as a desired value transmitter for said control loop, wherein said current mirror of said actual value transmitter and said desired value transmitter each include first and second transistors of a given conductivity type having emitter-collector paths, said first transistor of said current mirror being connected as a diode, and said desired value transmitter and said actual value transmitter each includes a current mirror having third and fourth transistors of a conductivity type being opposite said given type and having emitter-collector paths, said third transistor of said current mirror of said desired value transmitter and said actual value transmitter being connected as a diode, the collector-emitter paths of said first and fourth transistors being connected together in series, and the collector-emitter paths of said second and third transistors being connected together in series.

4,965,511

TEST CIRCUIT FOR LOGIC ICS

Akira Nishimura, Yokohama, and Yasuyuki Nozuyama, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 22, 1989, Ser. No. 370,046

Claims priority, application Japan, Jun. 22, 1988, 63-154016

Int. Cl.[5] G01R *15/12*

U.S. Cl. 324—73.1 4 Claims

3. A test circuit comprising:

(a) an arithmetic block to be tested including arithmetic means for operating multiple bits as well a including various registers relates to the arithmetic means;

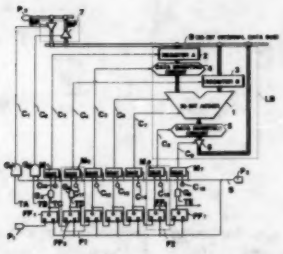
(b) a plurality of flip-flops for holding test control data supplied from a first pin, said flip-flops being connected to form a shift register;

(c) a plurality of multiplexers for selectively supplying a

plurality of test control signals and normal operation control signals to said arithmetic block to be tested to control respectively elements in the arithmetic block;

(d) a second pin connected to said flip-flops and multiplexers to provide a test mode signal at the time of test;

(e) bus switching means connected between a third pin and an internal data bus to control test data input from the third pin to said arithmetic block via the internal data bus as well as outputting operation results from said arithemtic block to the third pin via the internal data bus;



(f) gate means for controlling data input and output with respect to said bus switching means; and

(g) timing signal generating means for generating timing signals for controlling said gate means under a test mode,

(h) under the test mode, said flip-flops holding the test control data and said multiplexers generating the test control signals according to the test mode signal given by said second pin, while the test data being inputted according to the timing signals thus testing said arithmetic block at high speed.

4,965,512

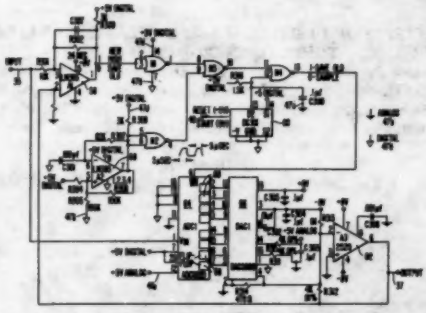
TRANSIENT CURRENT PEAK DETECTOR

David E. DeBar, and Indravadan J. Shah, both of Manassas, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 18, 1989, Ser. No. 429,736

Int. Cl.[5] G01R *19/16*; H03K *5/153*

U.S. Cl. 324—103 P **3 Claims**



2. A transient current peak detector circuit, for detecting current pulses in a power line connected to a device under test, comprising:

a first current transducer operatively coupled to said power line, having an output terminal;

an NPN bipolar transistor having its base connected to said output of said transducer, its collector connected to a positive reference potential, and its emitter coupled to a first node;

a storage capacitor having a first plate coupled to said first node and a second plate coupled to a second reference potential;

a comparator having a first input connected to said first node, a second input and an output, for providing a binary level signal at said output when said first input has a greater potential than said second input thereof;

a two-input gate having a first input connected to said output of said comparator and a second input connected to a source of periodic clock pulses, and having an output terminal, for transferring said clock pulses to said output terminal thereof when said comparator applies an on signal to said first input of said gate;

an analog-to-digital converter having an enabling input connected to said output of said gate and having a signal input coupled to said first node, and having a plurality of binary bit outputs which represent in digital form the analog value of a signal applied at the input thereof;

a digital-to-analog converter having a plurality of binary bits inputs, each respectively coupled to a corresponding one of said plurality of binary bit outputs of said analog-to-digital converter, and further having an analog output, for outputting an analog signal having a magnitude corresponding to a digital value stored in said analog-to-digital converter corresponding to the analog signal applied at the input thereof;

a voltage incrementing means having an input connected to the output of said digital-to-analog converter, and an output, for applying a fixed incremental voltage to said analog signal output from said digital-to-analog converter, said incrementing means having its output connected to said second input of said comparator;

said comparator continuing to output an on-state signal from its output until said signal output from said incrementing means is greater in magnitude than said signal input to said first inpu t of said comparator, at which point said comparator outputs an off-state signal thereby disabling said gate and preventing said clock signals from being transferred to said enable input of said analog-to-digital converter;

said analog-to-digital converter at that point having a digital value stored therein corresponding to the peak value of a transient current pulse detected by said current transducer coupled to said power line.

4,965,513

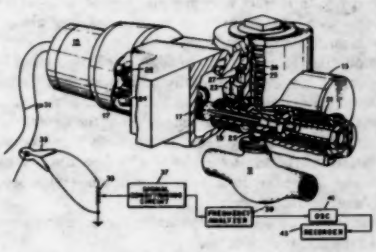
MOTOR CURRENT SIGNATURE ANALYSIS METHOD FOR DIAGNOSING MOTOR OPERATED DEVICES

Howard D. Haynes, Kingston, and David M. Eissenberg, Oak Ridge, both of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Nov. 14, 1989, Ser. No. 436,139

Int. Cl.[5] G01R *23/00, 31/02*

U.S. Cl. 324—158 MG **4 Claims**



1. A method for diagnosing operating characteristics of a device driven by an operating electric motor wherein said device produces noise in a current drawn by said motor, comprising the steps of:

sensing said current drawn by said motor;

determining a frequency range based on a specific operating element whose operating characteristics are to be analyzed;

measuring jamplitudes of various frequencies of said current within said frequency range;

storing said ;measured frequency amplitudes as a frequency spectrum in a recording device in the form of a frequency domain recording to form a a recording of a frequency spectrum;

comparing said stored frequency domain recording with other frequency domain recordings to detect changes in the operating characteristics of said device; and

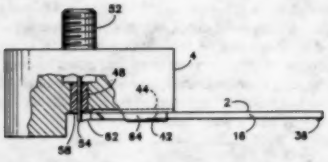
comparing said stored frequency domain recording with time domain recordings to determine additional operating characteristics of said device.

4,965,514

APPARATUS FOR PROBING A MICROWAVE CIRCUIT

Geoffrey C. Herrick, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 5, 1989, Ser. No. 363,027
Int. Cl.[5] G01R *31/02*
U.S. Cl. 324—158 P **4 Claims**



1. Apparatus for probing a microwave circuit, comprising:

a dielectric substrate having first and second opposite main surfaces, the substrate having a first edge, an end region opposite the first edge, and second and third edges extending from opposite respective ends of the first edge towards said end region,

a coplanar waveguide on the first main surface of the substrate, the coplanar waveguide comprising a signal conductor extending from the first edge of the substrate to the end region thereof and first and second ground conductors extending adjacent the signal conductor along opposite respective edges thereof,

a mounting structure comprising a block of conductive material having a generally planar surface region, the substrate being attached to the mounting structure with the generally planar surface region of the mounting structure in confronting relationship with the second main surface of the substrate, the block of conductive material being formed with a bore that opens at the generally planar surface region,

a core conductor extending within the bore and connected to the signal conductor,

dielectric material within the bore and separating the core conductor from the block of conductor material, and

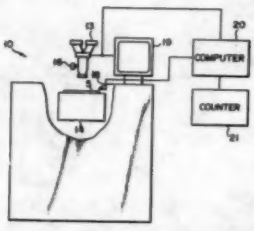
conductive means connecting the ground conductors to the block of conductive material over a substantial portion of the length of the second and third edges of the substrate from the first edge towards said end region.

4,965,515

APPARATUS AND METHOD OF TESTING A SEMICONDUCTOR WAFER

Wataru Karasawa, Yokohama, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Apr. 26, 1989, Ser. No. 343,370
Claims priority, application Japan, Oct. 15, 1986, 61-244948
Int. Cl.[5] G01R *31/28*
U.S. Cl. 324—158 R **9 Claims**



1. An apparatus for testing a semiconductor wafer on which devices are arranged at regular intervals in a matrix pattern, said apparatus comprising:

probing test means for electrically testing the devices sequentially;

marking means for marking those of the devices in the matrix pattern which are determined to be defective by the probing test means;

image scanning means for optically scanning the semiconductor wafer including those devices which are determined to be defective and bear markings, and generating an image-signal representing the scanned image of the semiconductor wafer;

comparing/determining means for comparing the image-signal with a reference-signal and determining that the device does not have a marking when the signals coincide with each other and that the device has a marking when the signals do not coincide with each other; and

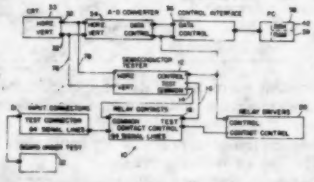
counting means for counting those of the devices which have been determined by the comparing/determining means to have markings or not to have markings.

4,965,516

SYSTEM FOR DIGITIZING AND DISPLAYING ANALOG SIGNATURES OF INTEGRATED CIRCUITS

Mahesh Parshotam, Edmonds; Alan D. Howard, Bothell; Robert D. Traulsen, Seattle; James L. Pennock, Seattle; James W. Hoo, Seattle, and Michael M. Masten, Everett, all of Wash., assignors to Huntron Instruments, Inc., Mill Creek, Wash.

Filed May 27, 1988, Ser. No. 200,011
Int. Cl.[5] G01R *31/28, 13/20*
U.S. Cl. 324—158 R **15 Claims**



1. An apparatus for developing, digitizing, and displaying analog signature information, comprising:

means for developing an analog signature signal representa-

tive of the operating condition of a selected element of an electronic circuit;

means for converting said analog signature signal to test digital values and storing said test digital values;

means for developing and storing reference digital values for the same element as said selected element, wherein said same element is known to be operating properly;

means responsive to said stored digital values and said reference digital values, respectively, to produce reconstructed analog signatures therefrom which are substantially identical to analog signatures obtained directly from said selected element and said same element; and

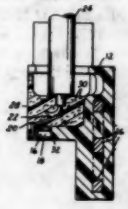
means for simultaneously displaying said reconstructed signatures.

4,955,517

FLUX CONCENTRATOF FOR MAGNETIC SENSORS

Randolph A. Shelton, and Robert E. Weber, both of Newport News, Va., assignors to Siemens-Bendix Automotive Electronics L.P., Troy, Mich.

Filed Aug. 21, 1989, Ser. No. 396,593
Int. Cl.[5] G01R *33/06*
U.S. Cl. 324—174 **9 Claims**



1. In a wheel speed sensing system comprising a magnet that is polarized at regular circumferential intervals and that rotates with the wheel, and a magnetically responsive sensor that is disposed stationarily adjacent the magnet and senses the passage of the polarized intervals of the magnet past the sensor, said sensor comprising a magnetically non-conductive housing having a cavity with a contiguous pocket, and a magnetic flux sensing element, such as a Hall device, disposed in said pocket, the improvement for both capturing the sensing element within said pocket and concentrating the magnetic flux issued by said magnet toward said sensing element, said improvement comprising a potting compound within said cavity capturing said sensing element within said pocket and a multitude of magnetically conductive fragments interspersed throughout said potting compound.

4,965,518

MODIFIED VISCOMETER FOR EMPLOYMENT IN TORQUE MAGNETOMETRY

Ashok K. Agarwala, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 3, 1989, Ser. No. 346,857
Int. Cl.[5] G01R *33/00*; G01N *27/72*
U.S. Cl. 324—228 **5 Claims**

1. A method for measuring magnetic properties of a workpiece, comprising:

(1) providing an assembly, the assembly comprising

(a) a viscometer, the viscometer comprising

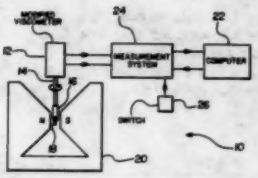
(i) an external spindle, and

(ii) means for attaching the workpiece to the spindle; and

(b) a magnet which can develop a magnetic field enveloping the workpiece;

(2) positioning the workpiece so that it is attached to the spindle and enveloped by the magnetic field;

(3) actuating the viscometer, thereby imparting movement to the workpiece; and



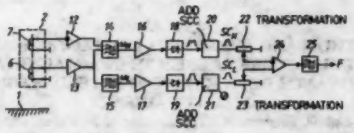
(4) measuring a resultant torque thereby imparted to the workpiece.

4,965,519

SUPPRESSION OF THE EFFECT OF HARMLESS SURFACE DEFECTS IN EDDY CURRENT TESTING BY SENSITIVITY CHARACTERISTIC COMPENSATION

Bengt H. Törnblom, Västerås, Sweden, assignor to Tornbloms Kvalitetskonthol AB, Västerås, Sweden

Continuation of Ser. No. 72,673, Jul. 13, 1987, Pat. No. 4,851,774. This application Feb. 15, 1989, Ser. No. 311,348
Claims priority, application Sweden, Jul. 15, 1986, 8603113
The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.
Int. Cl.[5] G01N *27/72*; G01R *33/12*
U.S. Cl. 324—225 **4 Claims**



1. An eddy current sensing device for monitoring a test object for the presence of surface defects, comprising:

at least one sensing transducer adapted to move relative to at least a part of the surface of the test object for scanning said surface having both surface defects and harmless surface deformations;

means for supplying at least partially separate parts of said sensing transducer with currents of different carrier frequencies; and

means for reducing the sensitivity characteristic of said at least one sensing transducer in the direction of scanning movement with respect to each harmless surface deformation, at least partially by processing differently said current carrier frequencies from at least two at least partially separate parts of said sensing transducer, said currents being derived at any given time from substantially the same part of the test object to indicate defects and disregard harmless deformation in said test object.

4,965,520

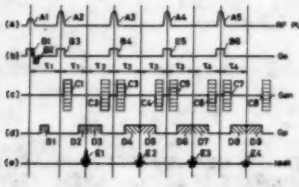
MAGNETIC RESONANCE IMAGING METHOD

Hidenobu Sakamoto, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1988, Ser. No. 284,419
Claims priority, application Japan, Dec. 15, 1987, 62-315321; Jan. 8, 1988, 63-1272
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 **9 Claims**

1. A method of magnetic resonance imaging comprising the steps of:

(a) generating a static magnetic field through a sample to be examined;
(b) applying a first RF magnetic field pulse at a first slice select gradient pulse for designating a slice plane of the sample;
(c) applying a first signal reading gradient pulse;
(d) applying a second RF magnetic field pulse and a second slice select gradient pulse;
(e) applying a first phase encoding gradient pulse having a predetermined pulse area;



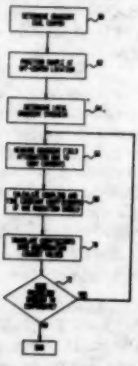
(f) applying a second signal reading gradient pulse to generate a magnetic resonance signal from the sample;
(g) applying a second phase encoding gradient pulse having a polarity opposite to said first phase encoding gradient pulse; and
(h) repeating said steps (d) through (g) a plurality of times to construct a slice image on the basis of a plurality of said magnetic resonance signals from said repeated steps (d) through (g), an intensity of said first phase encoding gradient pulse varied to have a different value for each of said repeated steps (d) through (g).

4,965,521

METHOD AND APPARATUS FOR COMPENSATING EDDY CURRENT EFFECTS IN A MAGNETIC RESONANCE DEVICE HAVING PULSED MAGNETIC FIELD GRADIENTS

Heinz Egloff, Fremont, Calif., assignor to Spectroscopy Imaging Systems, Fremont, Calif.

Filed Aug. 11, 1989, Ser. No. 392,872
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—312 13 Claims



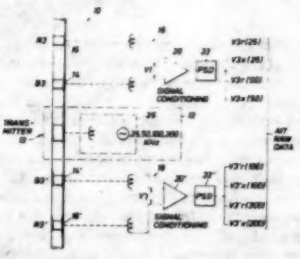
1. A method for the compensation of an eddy current magnetic field in the magnetic field of a pulsed gradient coil of an MR scanning apparatus, comprising the steps of:
(a) positioning an MR-active sample a distance along a given coordinate axis within the magnetic field of said gradient coil which is remote from its origin;
(b) applying a plurality of time-sequential gradient coil pulses to said gradient coil for generating a corresponding plurality of gradient magnetic field pulses along said given coordinate axis;
(c) irradiating said sample with an RF excitation pulse a given time delay which is increased following application of each of said gradient coil pulses, so as to generate a plurality of time-sequential MR signals;
(d) measuring and storing as data a Fourier transformation of each of said time-sequential MR signals, said stored data being representative of a measure of said eddy current magnetic field;
(e) calculating correction coefficients for compensating the magnetic field of said gradient coil with respect to said eddy current magnetic field using peak frequency shift data determined from the stored data of successive ones of said MR signals which have been Fourier transformed; and
(f) applying said correction coefficients so as to generate a pre-distorted gradient coil pulse which will compensate for the affect of said eddy current magnetic field upon said gradient coil magnetic field.

4,965,522

MULTIFREQUENCY SIGNAL TRANSMITTER WITH ATTENUATION OF SELECTED HARMONIES FOR AN ARRAY INDUCTION WELL LOGGING APPARATUS

Gary A. Hazen, and Don T. Macune, both of Houston, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Nov. 9, 1988, Ser. No. 269,262
Int. Cl.[5] G01V *3/28*
U.S. Cl. 324—339 16 Claims



1. In an induction well tool adapted to be disposed in a borehole, a transmitter means connected to a transmitting coil for transmitting a signal into said borehole via said coil, said signal inducing in a surrounding formation of the bore hole a corresponding signal, the transmitter means comprising:
multifrequency signal transmission means connected to said transmitting coil for transmitting into said borehole via said coil a multifrequency output signal, the multifrequency output signal including a plurality of harmonic frequencies which extend between a fundamental frequency and a particular harmonic frequency, the harmonic frequencies above said particular harmonic frequency being substantially attenuated, selected ones of the harmonic frequencies below said particular harmonic frequency being substantially attenuated to reduce power dissipation by said transmission means, a plurality of non-selected ones of the harmonic frequencies below said particular harmonic frequency not being attenuated, said selected ones inducing a second harmonic, said multifrequency output signal inducing in the formation a plurality of signals corresponding in number to the number of frequencies inherent in said multifrequency output signal.

4,965,523

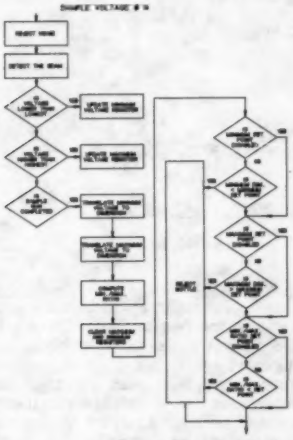
GLASS CONTAINER INSPECTION MACHINE WITH REJECTION PARAMETER SELECTOR

Russ J. Baker, Horseheads; Robert A. Hansen, Elmira, both of N.Y.; Paul F. Scott, Hartford, Conn., and Edward F. Vozenilek, Clarks Summit, Pa., assignors to Emhart Industries, Inc., Towson, Md.

Continuation-in-part of Ser. No. 343,712, June 12, 1989, Division of Ser. No. 253,832, Oct. 5, 1988, Pat. No. 4,862,062. This application Sep. 29, 1989, Ser. No. 414,919

Int. Cl.[5] G01R 27/26

U.S. Cl. 324—672 5 Claims



1. An apparatus for measuring the wall thickness of a glass container, said apparatus comprising;

sensing means for producing a signal representative of the thickness of a wall of a glass container presented to it;

means for presenting a glass container to said sensing means so that its wall thickness may be sensed; and

first means responsive to said sensing means for providing a minimum thickness signal representative of the minimum wall thickness of said container;

second means responsive to said sensing means for providing a maximum thickness signal representative of the maximum wall thickness of said container;

selecting means for selecting one or more parameters from the group consisting of maximum wall thickness and minimum wall thickness;

rejecting means responsive to said minimum thickness signal, said maximum thickness signal, and said selecting means for rejecting a glass container based on said one or more selected parameters.

4,965,524

GLITCH FREE CLOCK SELECT

Paul J. Patchen, Arlington, Tex., assignor to National Semiconductor Corp., Santa Clara, Calif.

Continuation of Ser. No. 204,671, Jun. 9, 1988. This application Aug. 11, 1989, Ser. No. 393,011

Int. Cl.[5] H03K 17/00, 5/13, 1/17, 17/56

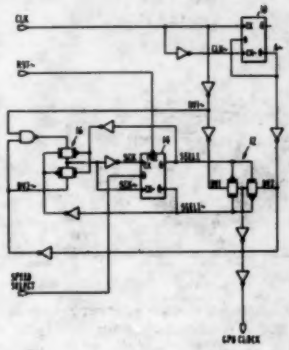
U.S. Cl. 328—72 10 Claims

1. A clock select circuit comprising:

(a) a synchronous divider responsive to an input clock signal for generating first and second synchronous internal clock signals having first and second frequencies, respectively;

(b) a two-to-one multiplexor which receives the first and second internal clock signals as inputs and which selects between the first and second internal clock signals to provide the first internal clock signal as a system clock output signal in response to a first select input and to provide the second internal clock signal as the system output clock signal in response to a second select input;

(c) selection means responsive to the first and second internal clock signals for generating the first and second select



inputs such that the multiplexor switches between the first and second internal clock signals on a logic transition that is common to both the first and second internal clock signals.

4,965,525

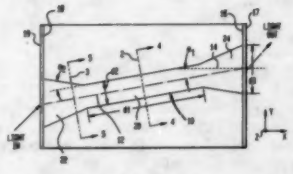
ANGLED-FACET FLARED-WAVEGUIDE TRAVELING-WAVE LASER AMPLIFIERS

Chung-En Zah, Marlboro, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Nov. 13, 1989, Ser. No. 435,625

Int. Cl.[5] H01S 3/08

U.S. Cl. 330—4.3 12 Claims



1. A traveling-wave laser amplifier comprising:

a semiconductor body having at least one planar antireflection-coated facet,

and a waveguide in said body extending to said facet for propagating the fundamental mode of an optical signal,

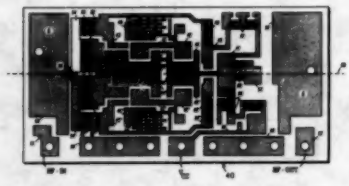
said waveguide having a main longitudinal axis that is disposed off-normal with respect to said planar facet, said waveguide having a relatively long portion that has the same width at all points along said axis, and said waveguide having a relatively short end portion comprising a flared portion that extends between one end of said long portion and said facet for reducing the effective modal reflectivity of the fundamental mode at said antireflection-coated facet.

4,963,526

HYBRID AMPLIFIER

Scott Craft; Henry L. Pfizenmayer, and Frederick C. Wernett, all of Phoenix, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jul. 14, 1989, Ser. No. 380,230
Int. Cl.[5] H03F 3/68
U.S. Cl. 330—66 17 Claims



1. A high frequency electronic assembly, comprising:

first and second transistor chips for amplifying signals, each having input, reference and output terminals, wherein the output of the first chip is coupled to the input of the second chip; and

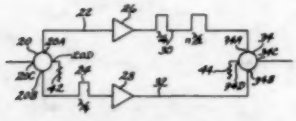
board means for supporting and coupling components, including the transistor chips, and having first and second metal regions to which, respectively, the first and second chips are attached, and a U-shaped third metal region extending at least partially around three sides of the first metal region and a fourth U-shaped metal region extending at least partially around three sides of the second metal region.

4,963,527

GAIN EQUALIZER FOR MICROWAVE BALANCED AMPLIFIER CONFIGURATION

Robert T. Clark, Buena Park, and Rick A. Crist, Chino, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 20, 1989, Ser. No. 410,177
Int. Cl.[5] H03F 3/68
U.S. Cl. 330—124 R 22 Claims



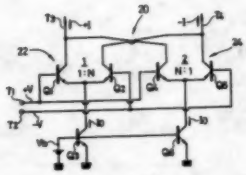
1. In an M-way microwave balanced amplifier configuration comprising an input power divider for dividing an input signal into M signal components at M respective output ports, M microwave amplifier circuits for amplifying corresponding ones of the M signal components and characterized in that the gain of the circuits decreases or increases with increasing signal frequency within the frequency band of operation, M input transmission lines for connecting respective ones of the output ports of the input divider to respective ones of the inputs to the M amplifier circuits, an output power combiner for combining the signals received at M input ports into a combined output signal at an output port, and M output transmission lines for connecting respective ones of the outputs of said M amplifier circuits to respective ones of the inputs of the output combiner, there being M signal paths between the input divider and output combiner defined by said M input lines, said M amplifier circuits and said M output lines, a gain equalizer for equalizing the gain slope of the amplifier circuits over the frequency band of operation to minimize output variations over the frequency band, said equalizer comprising unequal electrical lengths of said M signal paths, the inequalities selected so that gain equalization is achieved over the frequency band of operation through the loss of power due to phase errors in the signals combined at the output combiner.

4,965,528

CROSS-COUPLED DIFFERENTIAL AMPLIFIER

Taiwa Okanobu, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 13, 1989, Ser. No. 379,110
Claims priority, application Japan, Jul. 18, 1988, 63-178765; Jul. 21, 1988, 63-182615
Int. Cl.[5] H03F 3/45
U.S. Cl. 330—252 11 Claims



1. An amplifier comprising:

first differential amplifier means including a first constant current source, and first and second transistors having respective emitters connected in common to said first constant current source;

second differential amplifier means including a second constant current source, and third and fourth transistors having respective emitters connected in common to said second constant current source;

said first and third transistors having bases thereof connected together and said second and fourth transistors having bases thereof connected together, and said first and third transistors having collectors thereof connected together and said second and fourth transistors having collectors thereof connected together;

a ratio of a collector current of said first transistor to a collector current of said second transistor, and a ratio of a collector current of said fourth transistor to a collector current of said third transistor being each selected to be 1:N, wherein N is between approximately 2.5 and 6;

means for applying an input signal voltage at the bases of said first and third transistors and at the bases of said second and fourth transistors; and

means for deriving one output signal current from at least one of the collectors of said first and third transistors and another output signal current from at least one of the collectors of said second and fourth transistors.

4,965,529

HIGH CURRENT, VERY WIDE BAND TRANSCONDUCTANCE AMPLIFIER

Owen B. Laug, Barnesville, Md., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

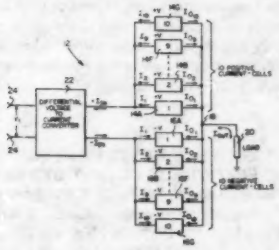
Filed Sep. 21, 1989, Ser. No. 410,387
Int. Cl.[5] H03F 3/45
U.S. Cl. 330—255 14 Claims

1. A high current transconductance amplifier comprising:

differential voltage to current converter means for converting an input voltage to a positive current signal and a negative current signal;

a plurality of positive current mirror cells, said positive mirror cells connected to each other in parallel and connected to said converter on their input side each of which receives a portion of said positive current signal and each of which generates a positive output current signal;

a plurality of negative current mirror cells, said negative mirror cells connected to each other in parallel and connected to said converter on their input side each of which receives a portion of said negative current signal and each of which produces a negative output current signal; and



means for connecting each of the positive output current signals from said plurality of positive current mirror cells and each of said negative output current signals from said plurality of negative current mirror cells to add together forming an output current signal delivered to a load.

4,965,530

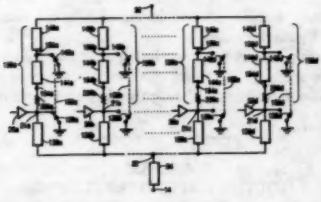
PARALLELLED AMPLIFIER WITH SWITCHED ISOLATION RESISTORS

Allen Katz, West Windsor Township, Mercer County, N.J., assignor to General Electric Company, East Windsor, N.J.

Filed Sep. 26, 1989, Ser. No. 413,553

Int. Cl.[5] H03F *3/68*

U.S. Cl. 330—295 **17 Claims**



1. A parallelled amplifier arrangement for operation at a frequency, comprising:

a first plurality of amplifiers, each including an output port for producing amplified signal at said output port, the amplitudes of said amplified signal at each of said output ports being nominally equal;

a power combining node;

a plurality, equal to said first plurality, of first impedance transformers, each of said first impedance transformers being coupled to the output port of one of said amplifiers, all of said first impedance transformers also being coupled to said power combining node, for coupling said amplified signals from said first plurality of amplifiers to be combined at said power combining node;

a plurality, equal to said first plurality, of controllable first short-circuiting switch means, each of said first short-circuiting switch means being coupled to said output port of one of said amplifiers, for controllably short-circuiting the output port of one or more of said amplifiers;

a second node;

a plurality, equal to said first plurality, of switched isolation means, each of said switched isolation means including a series path extending from said output port of one of said amplifiers to said second node, said series path including first and second cascaded transmission lines defining a junction therebetween, each of said first and second transmission lines having a length equal to an odd integer number of quarter wavelengths near the frequency of operation, each of said switched isolation means further including second short-circuiting switch means coupled to said junction between said first and second transmission lines, for short-circuiting said first and second transmission lines at a location remote from said second node and from said output port of the associated amplifier, each of said switched isolation means also including series resistance means associated with said series path, for dissipating energy associated with unwanted operating modes of the parallelled amplifiers arrangement when the second switch means which is associated with said series resistance means is open, said second switch when closed preventing dissipation of power in said series resistance means.

4,965,531

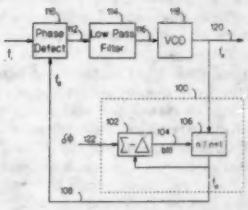
FREQUENCY SYNTHESIZERS HAVING DIVIDING RATIO CONTROLLED BY SIGMA-DELTA MODULATOR

Thomas A. D. Riley, Osgoode, Canada, assignor to Carleton University, Ottawa, Canada

Filed Nov. 22, 1989, Ser. No. 439,662

Int. Cl.[5] H03L *7/197*; H03K *21/02*

U.S. Cl. 331—1 A **21 Claims**



1. A frequency synthesizer comprising:

detector means (110) responsive to a reference signal and a phase control signal (f_d) for generating a control signal that varies in dependence upon the phase difference between said reference signal and said phase control signal;

means (118) responsive to said control signal for generating an output signal (f_o) whose frequency varies in dependence upon said control signal;

means (106) for dividing said output signal (f_o) to provide said phase control signal (f_d), said dividing means having a control input and being operable to vary its division ratio in dependence upon a ratio control signal (b{t}) applied to said control input; and

second or higher order sigma-delta modulator means (102) responsive to a frequency control signal ($\delta\phi$) and to said phase control signal (f_d) to provide said ratio control signal (b{t}), the sigma-delta modulator means (102) being arranged to displace any quantization noise in said ratio control signal (b{t}) away from the frequency of said phase control signal (f_d) and multiples thereof.

11. A frequency synthesizer comprising variable modulus divider means (106) for dividing a reference signal (f_r) having a predetermined frequency to provide an output signal (f_{od}) of a desired frequency, the ratio of such division being variable in dependence upon a ratio control signal b(t), and second or higher order sigma-delta modulator means (102) responsive to a control signal ($\delta\phi$) and to said output signal (f_{od}) from said divider means (106) for supplying said ratio control signal b(t), the arrangement being such that any quantization noise in said ratio control signal b(t) is displaced away from the frequency of said output signal (f_{od}) and multiples thereof.

4,965,532

CIRCUIT FOR DRIVING ULTRASONIC TRANSDUCER

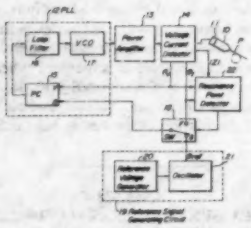
Tomohisa Sakurai, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 14, 1989, Ser. No. 365,826

Claims priority, application Japan, Jun. 17, 1988, 63-149415; Apr. 7, 1989, 1-86944; May 15, 1989, 1-120748

Int. Cl.[5] H03L 7/10, 7/12; G05D 19/02

U.S. Cl. 331—4 41 Claims



1. A circuit for driving an ultrasonic transducer comprising an oscillating means for generating a driving signal whose frequency is controlled in accordance with a frequency control signal;

a first phase detecting means for detecting a phase of said driving signal to generate a first phase detection signal;

a second phase detecting means for detecting a phase of the vibration of the ultrasonic transducer to generate a second phase detection signal;

a reference signal generating means for generating a reference signal whose frequency is continuously changed; and

a frequency control means for selectively changing the operation of the driving circuit between a sweep control mode in which the frequency of the driving signal generated from said oscillating means is controlled to follow the frequency of said reference signal by comparing one of said first and second phase detection signals with said reference signal and a feedback control mode in which the frequency of the driving signal generated from said oscillating means is controlled to follow a resonance frequency of the ultrasonic transducer by comparing said first and second phase detection signals with each other.

4,965,533

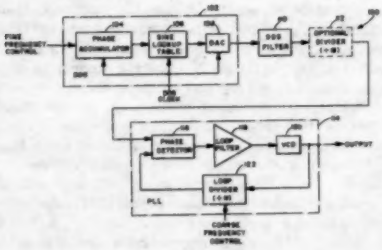
DIRECT DIGITAL SYNTHESIZER DRIVEN PHASE LOCK LOOP FREQUENCY SYNTHESIZER

Robert P. Gilmore, San Diego, Calif., assignor to Qualcomm, Inc., San Diego, Calif.

Filed Aug. 31, 1989, Ser. No. 401,152

Int. Cl.[5] H03L 7/18

U.S. Cl. 331—18 19 Claims



6. A frequency synthesizer comprising:

a direct digital synthesizer (DDS) having, a fine frequency control input and a DDS clock input for respectively receiving externally generated phase data and an externally generated clock signal, and an output at which a reference signal is provided;

a filter having an input, coupled to said DDS output, and an output; and

a phase lock loop having a loop input coupled to said filter output, a coarse frequency control input for receiving a divide-by-N signal, and a loop output wherein said loop provides at said loop output a synthesizer output signal of a frequency N times the frequency of said reference signal.

4,965,534

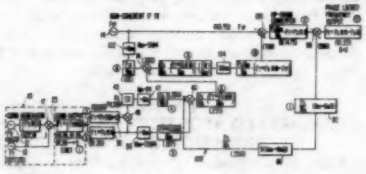
CHANNEL FREQUENCY GENERATOR FOR USE WITH A MULTI-FREQUENCY OUTPUT GENERATOR

Larry S. McKinney, Auburn, and Rezin E. Pidgeon, Jr., Atlanta, both of Ga., assignors to Scientific Atlanta, Atlanta, Ga.

Filed May 19, 1989, Ser. No. 354,277

Int. Cl.[5] H03B 21/00

U.S. Cl. 331—37 23 Claims



1. A channel frequency generator for use in an incrementally related coherent signal generator, said channel frequency generator comprising:

means for deriving a first and a second frequency from selected outputs of said incrementally related coherent signal generator; and

modulating means for modulating an input signal having a predetermined frequency to a frequency coherent selected channel frequency utilizing the first and second frequencies.

4,965,535

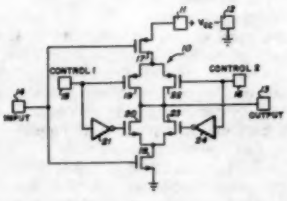
MULTIPLE SPEED OSCILLATOR

Darren D. Neuman, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 30, 1989, Ser. No. 373,766

Int. Cl.[5] H03B 5/36; H03F 3/16

U.S. Cl. 331—116 FE 6 Claims



1. A multiple gain state amplifier circuit including input and output terminal between which a controlled gain is achieved in response to control input signals, said circuit comprising:

a first two transistor inverter having the input electrodes of said two transistors connected to said input terminal and having the output electrodes of said two transistors cou-

pled by first switch means to said output terminal, said first switch means being responsive to a first control input signal; and

second switch means coupled between the output electrodes of said two transistors in said first inverter and said output terminal, said second swtich means being responsive to a second control input signal.

4,965,536

QUADRATURE AMPLITUDE MODULATION SYSTEM USING DIGITAL FILTERS

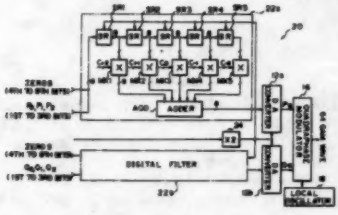
Yasuharu Yoshida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 30, 1989, Ser. No. 358,114

Claims priority, application Japan, May 28, 1988, 63-131233

Int. Cl.[5] H04L *27/36*

U.S. Cl. 332—103 **2 Claims**



1. A modulating device comprising:

two digital filters each for digitally processing input parallel n-bit data streams which include m (an integer equal to or smaller than n) data signals to thereby produce G (larger than m) data signal streams;

two digital-to-analog converters each being associated with a respective one of said two digital filters and, in response to outputs of said associated digital filters, individually producing multi-level signals P and Q; and

a quadraphase modulator for producing a quadrature amplitude modulated wave in response to the multi-level signals P and Q;

wherein said digital filters each comprises a plurality of n-bit shift registers, each of said n-bit shift registers being operative to receive said n-bit data streams and output B-bit (equal to or larger than m) data streams; a plurality of multipliers for multiplying said B-bit data streams by a fixed weighting coefficient, each of said weighting coefficients having A (larger than m) bits and each of said multipliers being connected to an output of a respective one of said n-bit shift registers; and an adder for adding outputs of said multipliers to produce said G data signal streams.

4,965,537

TUNELESS MONOLITHIC CERAMIC FILTER MANUFACTURED BY USING AN ART-WORK MASK PROCESS

Richard S. Kommrusch, Schaumburg, Ill., assignor to Motorola Inc., Schaumburg, Ill.

Continuation of Ser. No. 202,623, Jun. 6, 1988, abandoned. This application Dec. 18, 1989, Ser. No. 452,077

Int. Cl.[5] H01P *1/202*

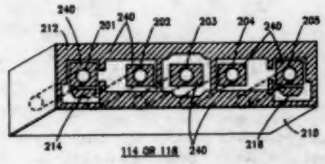
U.S. Cl. 333—202 **6 Claims**

1. A method of filter manufacture, comprising the steps of:

producing dielectric means comprised of a dielectric material having top, side, and bottom surfaces, forming in said dielectric means at least two holes extending from the top surface toward the bottom surface thereof and spatially disposed at a predetermined distance from one another, selectively covering the side and bottom surfaces of said dielectric means and said at least two holes with a conductive material to provide a transmission line resonator for each of said at least two holes, said method comprising the steps of:

measuring the value of a pre-selected frequency related characteristic of said dielectric means;

forming a plurality of artwork masks, each artwork mask being formed with different patterns which correspond to a range of values of the pre-selected frequency related characteristic;



selecting from the plurality of artwork masks one artwork mask which corresponds to a range of values including the measured value of the pre-selected frequency related characteristic; and

applying conductive material to the top surface of said dielectric means in accordance with the pattern of the selected one of said plurality of artwork masks, whereby no additional tuning by removal of conductive material on the top surface of said dielectric is required.

4,965,538

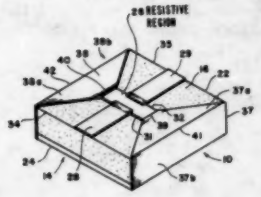
MICROWAVE ATTENUATOR

Joseph J. Mickey, III, West Palm Beach, Fla., assignor to Solitron Devices, Inc., Riviera Beach, Fla.

Filed Feb. 22, 1989, Ser. No. 313,640

Int. Cl.[5] H01P *1/22*

U.S. Cl. 333—81 A **5 Claims**



1. A microwave attenuator, comprising:

an insulative substrate having first, second, third and fourth edges;

a ground plane formed by a conductive layer coating a substantial portion of a first face of said insulative substrate;

a resistive region formed on a second face of said insulative substrate, opposite the first face thereof;

input/output electrodes connected to a first set of opposing sides of said resistive region and respectively extending towards the first and second edges of said insulative substrate;

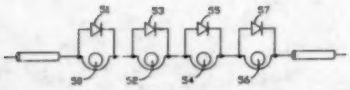
shunt electrodes connected to said ground plane and a second set of opposing sides of said resistive region, different from the first set of opposing sides, said shunt electrodes each having a trapezoidal shape on the second face of said insulative substrate, with a short side in contact with said resistive region and a long side at one of the third and fourth edges of said insulative substrate, respectively.

4,965,539

MICROWAVE NOTCH FILTER USING PIN DIODE SHUNTED YIG RESONATORS

Marinus L. Korber, Jr., San Carlos, Calif., assignor to Watkins-Johnson Company, Palo Alto, Calif.

Filed Jun. 2, 1989, Ser. No. 360,312
Int. Cl.[5] H01P *1/20, 1/218*
U.S. Cl. 333—202 **7 Claims**



1. A microwave notch filter comprising

a plurality of serially connected YIG resonators, each YIG resonator including a coupling wire loop and a PIN diode connected directly in parallel with said coupling wire loop,

first interconnect means for interconnecting one end of said plurality of serially connected YIG resonators to an r.f. signal source,

second interconnect means for interconnecting another end of said plurality of serially connected YIG resonators to a load,

inductive means connecting one or said interconnect means to a circuit ground potential, and

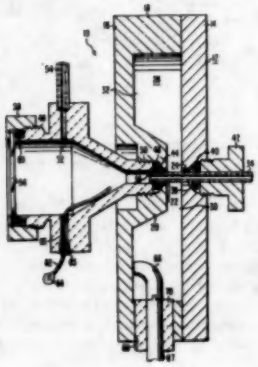
inductive means connecting the other of said interconnect means to a DC voltage source, whereby said PIN diodes in said YIG resonators can be forward-biased or reverse-biased by a DC voltage applied to said first interconnect means.

4,965,540

MICROWAVE RESONANT CAVITY

James J. Sullivan, New Castle County, Del., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 137,304, Dec. 23, 1987, abandoned. This application May 1, 1989, Ser. No. 345,813
Int. Cl.[5] H01P *7/06, 1/14*
U.S. Cl. 333—227 **30 Claims**



1. A resonant cavity for high frequency electromagnetic radiation used to excite a gaseous plasma comprising:

a housing having fixed, spaced side walls and an outer wall forming a cylindrical chamber having an axis extending through said side walls, the chamber having a first portion adjacent and around the axis which is narrower between the side walls than a second portion of the chamber which is connected to and surrounds the first portion;

a refractory tube extending along said axis of the chamber and through said side walls, said tube adapted to contain a gaseous plasma and having an open end to exhaust gases; and

loop means coupled to the inner surface of a wall of the housing within the chamber including a wire having one end adjacent to the inner surface of the wall and its other end connected to a coaxial connector extending through an opening in the outer wall of the housing for coupling a high frequency electromagnetic radiation into said chamber,

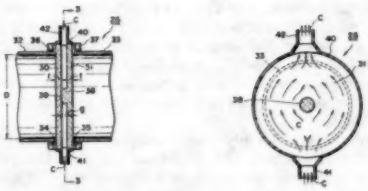
whereby the introduction of said electromagnetic radiation into said chamber initiates a gaseous plasma, said plasma remaining stable during subsequent operation.

4,965,541

WAVEGUIDE PROVIDED WITH DOUBLE DISK WINDOW ASSEMBLY HAVING DIELECTRIC DISKS

Yukio Okazaki, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 23, 1989, Ser. No. 355,570
Claims priority, application Japan, May 23, 1988, 63-125129
Int. Cl.[5] H01P *1/08*
U.S. Cl. 333—252 **11 Claims**



1. A double disk window which is to be cooled with a waveguide coolant and is used in a waveguide having first and second waveguide segments, said double disk window assembly comprising:

a first dielectric disk which is formed of a dielectric material of a type permitting a microwave to pass therethrough and is coupled air-tightly to the first waveguide segment, the microwave having a predetermined electric field pattern across the waveguide segment with an intensity which is concentrated in its peripheral regions and smaller in a central region; and

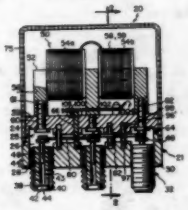
a second dielectric disk which is formed of a dielectric material of a type permitting the microwave to pass therethrough, and is located in a manner to face the first dielectric disk with a predetermined gap through which the coolant passes, and coupled air-tightly to the second waveguide segment, and which includes a first central coupling section, which is located in the central region of the electric field pattern, for mechanically coupling the second dielectric disk to the first dielectric disk.

4,965,542

MAGNETIC SWITCH FOR COAXIAL TRANSMISSION LINES

Victor Nelson, 8 Midvale Ct., East Northport, N.Y. 11731

Filed Feb. 28, 1989, Ser. No. 316,659
Int. Cl.[5] H01H *53/00*
U.S. Cl. 335—5 **19 Claims**



1. A magnetic switch for coaxial transmission lines, comprising:

a hollow body having spaced walls defining a closed cavity with laterally spaced bores in one of said walls;

first and second coaxial transmission lines engaged in said bores and having laterally spaced conductive first and second line terminals in said cavity;

an electrically conductive first contact member reciprocatable in said cavity between a closed circuit first position bridging said first and second line terminals, and open circuit second position spaced from said line terminals;

guide means in said cavity restraining said contact member to reciprocate between said first and second positions;

first magnet means supported by said body and arranged to move said contact member magnetically from said closed circuit first position to said open circuit second position;

second magnet means supported by said body and arranged to move said contact member magnetically from said open circuit second position to said closed circuit first position

an electromagnet having a magnetizable core and a winding on said core, said first magnet means comprising a first coil section of said winding, said electromagnet being effective to move said contact member magnetically from said closed circuit first position to said open circuit second position when said coil section is energized;

said second magnet means comprising a second coil section of said winding, said electromagnet being effective to move said contact member magnetically from said open circuit second position to said closed circuit first position when said second coil section is energized while said first coil section is deenergized; and

said contact member comprising a contact strip made of non-magnetic material, and at least one permanent magnet on said strip disposed or alternate attraction and repulsion by said electromagnet when said first and second coil sections are alternately energized.

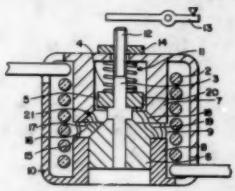
4,965,543

MAGNETIC TRIP DEVICE WITH WIDE TRIPPING THRESHOLD SETTING RANGE

Pierre Batteux, Vizille, France, assignor to Merlin Gerin, France

Filed Nov. 2, 1989, Ser. No. 430,367
Claims priority, application France, Nov. 16, 1988, 88 15198
Int. Cl.[5] H01H *9/00*
U.S. Cl. 335—174 **10 Claims**

1. A magnetic trip device with a wide tripping threshold setting range, comprising a fixed magnetic circuit bearing an excitation coil and having a first and a second polar part located one in the extension of the other and separated by a fixed air-gap and a moving core assembly, slidingly mounted inside said fixed magnetic circuit and having a first part of the core assembly with a polar surface defining a first variable air-gap with said first polar part, the value of which varies with the movement of the moving core assembly, wherein said moving core assembly comprises a second part mechanically united to the first part, and magnetically insulated from the latter, said second part defines with said second polar part a second variable air-gap, the attraction effects exerted on the moving core



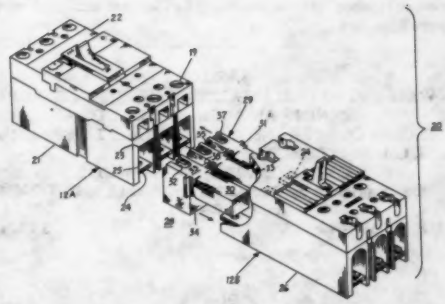
assembly by the magnetic fields generated by the coil in said first and second variable air-gaps being opposing, and an adjustment device is arranged to fix the initial position of the moving core assembly and to adjust the tripping threshold appreciably linearly.

4,965,544

MOLDED CASE CIRCUIT BREAKER EXHAUST BARRIER

Joseph B. Kelaita, Jr., Bristol; David Arnold, Chester, and James I. Smith, Avon, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Jan. 2, 1990, Ser. No. 459,896
Int. Cl.[5] H01H *9/02*
U.S. Cl. 335—202 **9 Claims**



1. A molded case circuit breaker line terminal exhaust gas insulation shield comprising:

an insulative line strap cover including a pair of opposing sidewalls, a top piece and a back piece inserted within a line terminal compartment on one circuit breaker protecting a first line terminal strap within said one compartment from contact with external ionized arc gases and controllably directing internal ionized arc gases away from the panelboard phase bus bars; and

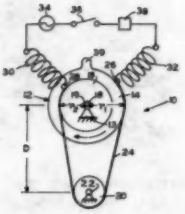
an insulative extension hingeably attached to said top piece and inserted within a llne terminal compartment within an adjoining circuit breaker to protect a second line terminal strap within said adjoining circuit breaker from said internal ionized gases originating from said one circuit breaker.

4,965,545

SHAPE MEMORY ALLOY ROTARY ACTUATOR

Alfred D. Johnson, Oakland, Calif., assignor to TiNi Alloy Company, Oakland, Calif.

Filed Aug. 9, 1989, Ser. No. 391,427
Int. Cl.[5] H01H 71/18, 61/06
U.S. Cl. 337—140 **23 Claims**



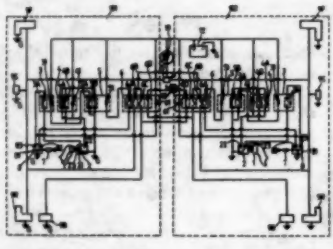
9. A rotary actuator comprising means forming first and second moment arms which project in generally opposite directions from a common axis, said first moment arm having a radial length r_1 and said second moment arm having a radial length r_2 which is less than r_1 by a predetermined amount, a reference structure, means mounting said moment arms for conjoint rotation relative to the reference structure about the common axis, an elongate element of shape memory alloy material, means for mounting one end of the element to the outer radial end of the first arm, means for mounting the other end of the element to the outer radial end of the second arm, means for heating the shape memory alloy material of the element through its phase change transition temperature to cause contraction of the length of the element toward its memory shape, and idler means for conducting portions of the shape memory alloy material of the element along a path which extends in a loop from the outer end of the first arm to the outer end of the second arm, said idler means holding the ends of the element under tension forces during contraction of the element with the tension forces applying torques on the respective moment arms whereby the resulting net torque causes relative rotation between the moment arms and reference structure.

4,965,546

WARNING DEVICE TO ALERT PASSERS-BY BEFORE OPENING AN AUTOMOBILE DOOR

Jih-Cheng Chang, 3Fl., No. 4, Lane 244, Hsing Lung Road, Sec. 2, Chin Mei, Taipei, Taiwan

Filed Aug. 31, 1989, Ser. No. 401,110
Claims priority, application Taiwan, Jul. 12, 1988, 77206568
Int. Cl.[5] B60Q 1/26
U.S. Cl. 340—468 **3 Claims**



1. A warning device to alert passers-by before opening an automobile door, comprising:

a left side unit;

a right side unit corresponding to said left side unit;

each one of said left side unit and said right side unit comprising:

a seat belt switch operable in association with a fastener for the seat belt on the side of the automobile corresponding to the side of said unit;

a door lock switch operable in association with a door lock for a door of the automobile on the side thereof corresponding to the side of said unit;

warning lights including at least one turn signal light for the side of the automobile corresponding to the side of said unit and a brake light mounted on the outside of the automobile to be visible to passers-by; and

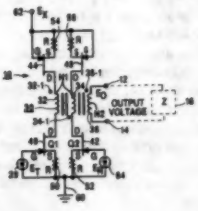
relay means controlled by said door lock switch and said seat belt switch for turning on said turn signal light for the side corresponding to the side of said unit when said seat belt fastener is disengaged after said seat belt has been engaged and said door lock has been locked and thereafter turning off said turn signal light when said door lock is again locked.

4,965,547

SIGNAL CONVERTER CIRCUIT

Rodger Ryan, San Jose, Calif., assignor to General Electric Company, King of Prussia, Pa.

Filed Jun. 9, 1989, Ser. No. 363,829
Int. Cl.[5] G08C 19/06
U.S. Cl. 340—870.350 **11 Claims**



1. A circuit for producing an output electrical signal proportional to the difference between a temperature of interest and a reference temperature, said circuit comprising in combination:

a differential transformer having first, second and third windings, each of said windings having first and second ends;

first, second, third and fourth field effect transistors (FET) each having a drain terminal, a source terminal and a gate terminal, one of the drain and source terminals of said first FET being coupled to said first winding first end, one of said drain and source terminals of said second FET being coupled to said second winding first end, one of said drain and source terminals of said third FET being coupled to said first winding second end, and one of said drain and source terminals of said fourth FET being coupled to said second winding second end, the other of said drain and source terminals of said first and second FET's being impedance coupled to a first circuit reference terminal adapted to receive a source of alternating current, said gate terminals of said first and second FET's being coupled to said first circuit reference terminal, the other of said drain and source terminals of said third and fourth FET's being impedance coupled to a second circuit reference terminal;

first means having first and second terminals for measuring a temperature of interest and having a parameter at said first means terminals which is a function of temperature, said first means terminals being coupled between said second circuit reference terminal and said third FET gate for

setting a current limit of said third FET as a function of said temperature of interest; and

second means having first and second terminals for measuring a reference temperature and having a parameter at said second means terminals which is a function of temperature, said second means terminals being coupled between said second circuit reference terminal and said fourth FET gate for setting a current limit of said fourth FET as a function of said reference temperature;

said third winding first and second terminals being coupled to said output terminals,

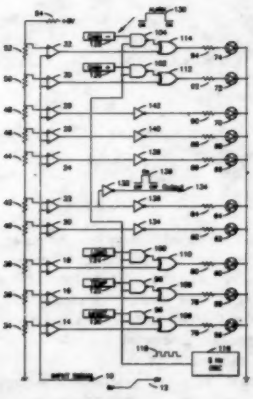
whereby when an alternating signal is received by said circuit, the output signal from said third winding is proportional to the difference in temperature between said temperature of interest and reference temperature.

4,965,548

LEVEL INDICATOR WITH ALARM

Robert W. Fayfield, Shorewood, Minn., assignor to Banner Engineering Corp., Minneapolis, Minn.

Filed Feb. 9, 1989, Ser. No. 308,733
Int. Cl.[5] G08B *29/00*; B60Q *1/00*
U.S. Cl. 340—511 **24 Claims**



1. An apparatus for displaying signal strength indications and diagnostic conditions, comprising:

(a) a plurality of indicators;

(b) means for sensing the signal strength indication;

(c) means for selectively operating said indicators to display the signal strength indication;

(d) means for sensing the diagnostic condition; and

(e) means for selectively operating at least one of said indicators to display both the signal strength indication and the diagnostic condition.

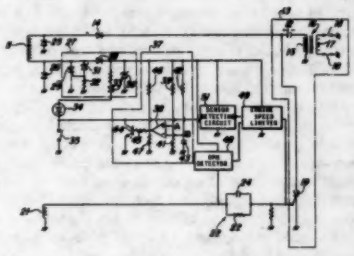
4,965,549

WARNING DEVICE FOR INTERNAL COMBUSTION ENGINE

Takashi Koike, 1400 Nippashi-cho, Hamamatsu-shi, Shizuoka-ken, Japan

Continuation of Ser. No. 104,046, Oct. 2, 1987, abandoned. This application Jun. 12, 1989, Ser. No. 368,941
Claims priority, application Japan, Oct. 3, 1986, 61-235797
Int. Cl.[5] G08B *29/00*; B60Q *1/00*
U.S. Cl. 340—516 **8 Claims**

1. A warning system for an internal combustion engine devoid of an external source of electric power, generating means driven by said engine, for generating the sole electric power upon the operation of said engine, an electrically powered warning device for indicating an abnormality in an engine condition, and means for operating said warning device upon the existence of both initial starting of said engine and running of said engine at a speed above a predetermined speed and in



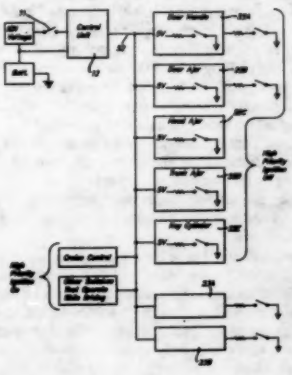
the absence of an abnormality in the engine condition for a time period only for self checking of said warning device.

4,965,550

AUTOMATIC WAKE-UP CIRCUIT ARRANGEMENT FOR A SINGLE WIRE MULTIPLEX SWITCH MONITORING SYSTEM

Thomas R. Wroblewski, Sterling Heights, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 30, 1989, Ser. No. 429,114
Int. Cl.[5] G08B *25/00*
U.S. Cl. 340—524 **4 Claims**



1. A single-wire serial link multiplex switch monitoring system containing a wake-up circuit arrangement for automatically monitoring a plurality of individual switches disposed throughout chosen locations of a monitored region, each of said switches having one end of a series-resistor sensing element connected to a moving switch element of said switches, said system comprising:

(a) a power and signal bi-directional single wire bus means, said bus means being routed throughout the monitored region near each of said plurality of switches;

(b) a first and a second group of smart switch sensor means disposed throughout the monitored region, each of said sensor means having means for forming a first connection across the series-resistor sensing element for each of said plurality of switches, and another means for forming a second connection across said bus means and a ground terminal, each of said switch sensor means having circuit means for providing current signals which route to said bus means, each of said current signal means placing a current signal on said bus means during a predetermined

time slot of a given polling cycle of said sensor means, said current signals being indicative of a status of said moving switch element of said switches and of said sensor associated with the predetermined time slot, each of said first group of smart switch sensor means having a stay-awake circuit means connected to said series-resistor sensing element of a high priority switch, said high priority switch and said stay awake circuit means providing a current signal on said bus means for waking up said system from a standby or wait condition;

(c) a driver and receiver means connected single-ended across a ground terminal and a terminating end of said single-wire bus means for generating power and voltage signals in the form of an offset, square-wave, pulse-train signal comprising a succession of coded-pulse signals superimposed over an offset-voltage signal, said coded-pulse signals providing a series of address codes for addressing said plurality of switches disposed at the remote locations during a POWER-ON condition, said pulse train being driven onto to said bus means from said driver and receiver circuit means, said first group of sensor means being connected to said bus means so as to receive said pulse train and to use a plurality of "states" of a first address pulse of said pulse train to awake said system from a wait or standby condition if one of said high priority switches has been activated, the awaking of said system causing a polling of both said first and second groups of sensor means, the polling also being initiated if said system is manually activated by a manual switch means used to apply power to said system, said polling of each sensor means being so that each of said plurality of sensor means are addressed in sequence and then allotted individual predetermined time on said bus means, the addressing of each sensor means and the allotment of time on said bus means being performed in a chosen sequential manner, the sequential manner forming the polling cycle of said sensor means, the polling of each sensor being at a chosen polling cycle rate, said driver and receiver circuit means also having means for receiving, interpreting and then converting said current signals sent over said bus means by an addressed first or second group sensor means into voltage signals indicative of the status of said addressed senor means and its associated switch;

(d) display means for displaying the status of each of said first and second groups of sensor means and said associated switches;

(e) a regulated voltage means having an input terminal connected to an unregulated voltage source and producing therefrom an immediate regulated voltage signal at a first output terminal, a first and a second delayed regulated voltage signal at a second and a third output terminal in response to a control signal indicative that one of the high priority switches or said manual switch means had been activated; and

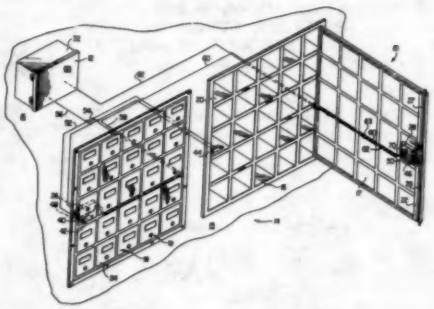
(f) microcontroller means having a first input terminal connected to said first output terminal of said regulated voltage means for providing power to a wait mode circuit within said microcontroller means, a second input terminal connected to said manual switch means for causing said microcontroller means to leave said WAIT mode and to start operating in a POWER-ON mode and a third input terminal connected to an output terminal of said driver and receiver circuit means that provides voltage signals indicative of the current signals placed on said bus means during the POWER-ON mode of said microcontroller means for reading voltage signals from said driver and receiver circuit means indicative of the status of each of said addressed sensor means and its associated switch, for causing the microcontroller means to go from the "WAIT" mode to the "POWER-ON" mode when one of the high priority switches or said manual switch means had been activated and for establishing a history of performance of each of said addressed sensor means, at least a pair of output terminals interconnecting said drive and receiver circuit means and said display means for writing voltage and clock signals to said driver and receiver circuit means that controls the generation of each pulse of the offset square wave voltage pulse train including the plurality of "states", a bus output terminal for transferring updated independent sensor means and switch data indicative of the status of said sensor means and said switches to said display means during each polling cycle and during each wake-up operation and a logic output terminal for routing control signals to said regulated voltage means.

4,965,551

BURGLAR ALARM SYSTEM FOR MULTI-UNIT MAILBOXES

Richard Box, P.O. Box 165311, Irving, Tex. 75016-5311

Filed Dec. 5, 1988, Ser. No. 279,878
Int. Cl.[5] G08B *13/08*
U.S. Cl. 340—545 **22 Claims**



1. A multi-unit mailbox alarm system for generating an alarm signal in response to the unauthorized opening of an access door disposed over a plurality of mailbox compartments, said door being secured by a postal lock of the type having linear actuation linkage therein, and said alarm system comprising:

a first sensor disposed between said access door and said mail compartments therebehind;

a second sensor disposed relative to said postal lock for detecting the linear actuation thereof;

an interconnection coupling said first sensor to said second sensor for relaying the state of said second sensor disposed relative to said postal lock, said interconnection being disposed relative to said first sensor and said second sensor; and

means for generating an alarm signal in response to sensing the unauthorized opening of said access door through said first sensor without first actuating said second sensor through said postal lock and transmitting the state of said second sensor through said interconnection to said first sensor.

4,965,552

ELECTRONIC ANIMAL REPELLANT APPARATUS

Charles S. Price, 312 Parkview Dr., Louisville, Ky. 40223, and John O. Adams, 1212 Wieble Rd., Crestwood, Ky. 40014

Filed Jul. 17, 1989, Ser. No. 380,892
Int. Cl.[5] H04B *1/02*; G08B *15/00*
U.S. Cl. 340—566 **17 Claims**

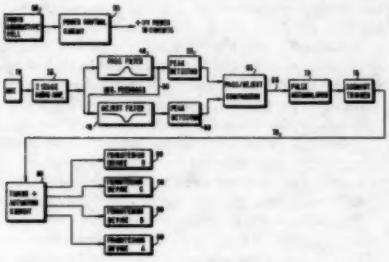
1. An animal repellant apparatus comprising:

detecting means for sensing the presence of an animal in the vicinity of the apparatus and for producing a trigger signal in response thereto;

generator means for generating an output signal sensible by the animal and adapted to repel the animal; and

activating means for activating said generator means in

response to said trigger signal, said activating means including means for delaying the activation of said generator means for a random period of time after receipt of said trigger signal.

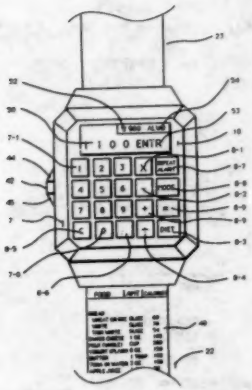


4,965,553

HAND-NEAR-MOUTH WARNING DEVICE

Thomas DelBiondo, II, 488 Whittier Ave., Plainedge, N.Y. 11756, and Luis A. Tirado, Jr., 20 S. Lot Rd., Smithtown, N.Y. 11787

Filed Apr. 27, 1989, Ser. No. 344,220
Int. Cl.[5] G08B *21/00*; G04B *47/00*; G06F *15/00*
U.S. Cl. 340—573 7 Claims



2. A calorie counter for counting calories consumed by the wearer, said counter comprising:

strap means for wearing the counter on a wrist;

memory means in the counter for registering calorie intakes;

entry means for entering calorie intakes into the memory means;

three-axis attitude sensor means for sensing when the wrist is in a position to place food in the wearer's mouth; and

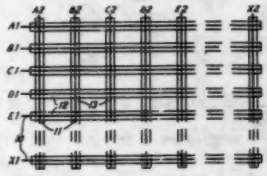
alarm means, for actuation by the three-axis sensor means, for warning the wearer that the wrist is in a position to place food in the wearer's mouth.

4,965,554

MOISTURE PRESENCE ALARM SYSTEM

John E. Darling, 45 Morley Road, Twickenham, Middlesex, Great Britain

PCT No. PCT/GB88/00598, § 371 Date Jan. 19, 1990, § 102(e) Date Jan. 19, 1990, PCT Pub. No. WO89/00681, PCT Pub. Date Jan. 26, 1989
PCT Filed Jul. 21, 1988, Ser. No. 457,714
Claims priority, application United Kingdom, Jul. 21, 1987, 8717235
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—604 9 Claims



1. A moisture presence alarm system having a sensor system which extends over an area to be monitored, and a detector device which receives signals from the sensor system, the latter comprising spatially separated conductors in contact, with a moisture absorbent material, characterised in that the sensor system comprises a first set of generally parallel conductors extending in one direction on one side of the moisture absorbent material, and a second set of generally parallel conductors arranged transversely of said direction on the other side of the material, wherein the conductors of at least one set are attached to moisture absorbent strips, and wherein the conductors are electrically independent, forming a matrix such that each conductor of each set forms a conductor pair at their respective crossing points and the conductors are narrow compared with the spacing between them; and in that the detector device detects changes in electrical conditions between said conductor pairs when a change in moisture occurs in the sensing area, the position of any leak within said area being determined by selective interrogation of the respective pairs of conductors.

4,965,555

ARRANGEMENT FOR ACCURATELY INSTALLING A REPLACEABLE REED SWITCH OF A DEVICE FOR MONITORING THE LIQUID LEVEL IN A TANK

Michael Hüttenberger, Reichenbach; Wolfgang Kleineberg, Calw; Hans Schaal, Esslingen; Thomas Attinger, Stuttgart, and Jürgen Dietz, Weinstadt, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 21, 1989, Ser. No. 396,353
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1988, 3828517
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—624 6 Claims

1. Device for monitoring a liquid level in a tank comprising:

a hollow rod projecting into an inside of the tank and closed at a projecting end thereof, the hollow rod being retained in the tank at an open bottom end,

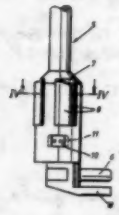
a reed switch for insertion as a slide-in part into the hollow rod, the read switch including a holder part for retaining the read switch at an interior of the hollow rod on an inner envelope surface thereof,

a float guided slidably and externally on the hollow rod including a permanent magnet for cooperating with the read switch,

an electrical contact terminal coupled to the reed switch for connectiag the reed switch to an electrical circuit,

radially formed tongues provided on an outer circumference

of the holder part and angled in a circumferential direction for abutting well sections of the inner envelope surface and for centering and retaining the reed switch in the hollow rod, and



bayonet fastening means for fixing the reed switch in an axial direction;

wherein the tongues are arranged in pairs on the circumference of the holder part, free ends of the tongues being combined in a pair and facing each other.

4,965,556

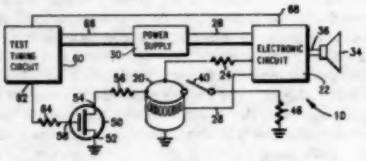
COMBUSTION PRODUCTS DETECTOR HAVING SELF-ACTUATED PERIODIC TESTING SIGNAL

James Brodecki, Darien; William Tanguay, Downers Grove, and Dale Fiene, Addison, all of Ill., assignors to Scott Corporation, Downers Grove, Ill.

Filed Mar. 8, 1988, Ser. No. 165,611

Int. Cl.[5] G08B *17/10*

U.S. Cl. 340—628 **32 Claims**



27. In a combustion products detector having sensor means that produces an electronic signal indicative of the concentration of combustion products present in the atmosphere surrounding the sensor means, electronic circuit means responsive to the electronic signal from the sensor means that produces an output electronic signal when the concentration of combustion products about the sensor means exceeds a pre-established level, alarm means responsive to the output electronic signal from the electronic circuit means that produces a perceptible indication when the concentration of combustion products about the sensor means exceeds the pre-established level, and power supply means that provides electrical power to energize said electronic circuit means, the power supply means being continuously supplied with electrical power by an alternating current electrical power source, the improvement which comprises:

timing signal means coupled to the power supply means for transmitting an alternating current timing signal at a frequency controlled by the frequency of the alternating current electrical power source;

electronically activatable switch means, coupled to the sensor means, for generating a test electronic signal transmitted by the sensor means to the electronic circuit means to simulate a concentration of combustion products about the sensor means exceeding the pre-established level; and

test timing means, coupled to said electronically activatable switch means, for periodically generating and transmitting a testing pulse to said electronically activatable switch means to activate said switch means thereby causing the test electronic signal to be transmitted at periodic time intervals established by said test timing means, whereby in response thereto the alarm means periodically produces a test perceptible indication that the concentration of combustion products about the sensor means exceeds the pre-established level at time intervals established by said test timing means, said test timing means including:

periodic timing pulse generator means for producing and transmitting periodic timing pulses having a frequency that is higher than the frequency of the testing pulses generated by said test timing means, said periodic timing pulse generator means having a pulse generation circuit that receives the alternating current timing signal transmitted by the power supply means and produces the periodic timing pulses in response thereto;

counter means, which receives and responds to the periodic timing pulses transmitted by said periodic timing pulse generator means, for counting said periodic timing pulses and in response to the count thereof repetitively and periodically producing and transmitting test time signals at the same frequency as the testing pulses generated by said test timing means; and

output test pulse generator means which receives the test time signals transmitted by said counter means and in response thereto generates the testing pulses which said test timing means transmits to said electronically activatable switch means.

4,965,557

INTERACTIVE CONTROL OF ENTERTAINMENT ELECTRONICS APPARATUS

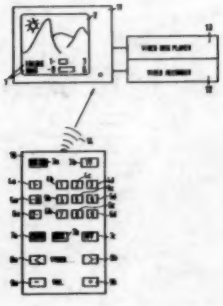
Charles Schepers, Karlsruhe-Hagsfeld, and Wolfgang Schröder, Pforzheim, both of Fed. Rep. of Germany, assignors to Nokia Unterhaltungselektronik, Pforzheim, Fed. Rep. of Germany

Continuation of Ser. No. 172,931, Mar. 18, 1988, abandoned, which is a continuation of Ser. No. 49,389, May 13, 1987, abandoned, which is a continuation of Ser. No. 518,241, Jul. 28, 1983, abandoned. This application Apr. 17, 1989, Ser. No. 339,942

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1982, 3228354

Int. Cl.[5] G09G *1/00*

U.S. Cl. 340—711 **23 Claims**



1. An improved entertainment electronics apparatus having a plurality of control functions, related ones of said control functions being grouped together in control groups, said apparatus comprising:

control means having a plurality of settable function keys and a control group selection key for selecting one of a plurality of different control groups, said settable function keys each being set in response to the selection of a control group for control of the control functions of the selected control group, a control group being selected by opera-

tion of at least one of a group of keys, including a settable function key, of the selected control group, that is set for allowing selection of another control group and the control group selection key;

display means;

character generator means, connected to said display means and in communication with said control means, for generating signals for said display means to display information relating to the selected one of said different control groups;

test memory means, connected to said character generating means and in communication with said control means, for storing a plurality of predetermined texts which correspond to and convey information relating to each respective one of said plurality of different control groups; and

call-up means for calling up a text corresponding to the selected control group from said memory means for presentation by said display means, said call-up means including means for selecting another text in response to the selection of another control group, whereby interactive control of the entertainment electronics apparatus is provided by displaying a text explaining the control functions of the settable function keys for each selected control group and by providing for the selection of another control group using the settable function keys.

4,965,558

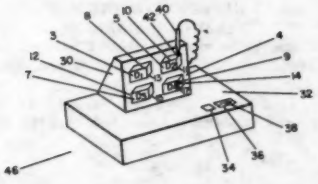
METHOD AND APPARATUS FOR IMAGE RETRIEVAL

Yosinori Saki; Hiroshi Kotera; Kazuo Unemoto; Tomohiko Arikawa, all of Kanagawa, Japan; Wayne Jung, Skokie, Ill.; Timothy Tutt, Skokie, Ill., and Mike Dunk, Libertyville, Ill., assignors to Interand Corporation, Chicago, Ill. and Nippon Telegraph and Telephone Corp., Kanagawa, Japan

Filed Jul. 15, 1987, Ser. No. 73,462

Int. Cl.[5] G09G *5/14*

U.S. Cl. 340—712 **11 Claims**



1. In an image storage and retrieval system having an image storage means, an image display means and a position indicating means, wherein the image storage means has stored therein one or more image groups, wherein one or more of the image groups contains a plurality of images, a method for retrieving an image comprising the steps of:

displaying on the display means representative images indicative of the images contained in the image groups, wherein each representative image further provides a representation of a third, orthogonal dimension that corresponds to one of the stored image groups wherein the magnitudes of the third, orthogonal dimensions are proportional to the number of images in the respective corresponding image groups;

indicating a position along one of the representations of the third, orthogonal dimensions with the position indicating means; and,

retrieving an image from the storage means wherein the retrieved image is dependent upon the position indicated by the position indicating means.

4,965,559

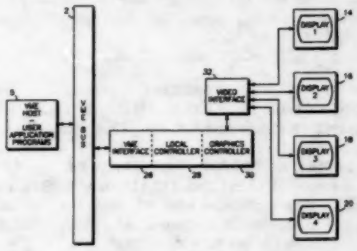
MULTI-CHANNEL GRAPHICS CONTROLLER

Thomas A. Dye, Cedar Park, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 31, 1988, Ser. No. 199,505

Int. Cl.[5] G09G *3/02*

U.S. Cl. 340—717 **10 Claims**



1. A video graphic display system for concurrently providing independent video graphic information to a plurality of video displays comprising:

bus interface means for receiving from a source, signals which represent independent video graphic information for said plurality of video displays;

local controller means, coupled to said bus interface means, for generation of separate graphics information from said signals;

a single graphics controller, coupled to said local controller means, for receiving said separate graphics information and providing separate independent sets of video information; and

video interface means, coupled to said single graphics controller, for receiving said separate independent sets of video information and concurrently providing video drive signals representing each of said separate independent sets of video information to said plurality of video displays.

4,965,560

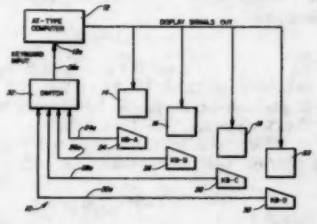
MULTIPLE KEYBOARD SWITCH

Rupert A. Riley, 54 Molynes Road, Kingston 10, Jamaica

Filed Nov. 17, 1988, Ser. No. 272,630

Int. Cl.[5] G09G *5/00*

U.S. Cl. 340—717 **19 Claims**



1. A manually operable keyboard selectable multi-keyboard system usable by an operator to continuously enter data through a selected keyboard for an operator determined period of time comprising:

central processing means having a 16 bit bidirectional data bus and a 24 bit address bus and usable with an operating system;

a plurality of manually operable keyboards; and

manually operable keyboard selecting means, coupled be-

tween each said keyboard and said processing means for switching only a selected one of said keyboards into electrical communication with said central processing means and for open circuiting all other keyboards with respect to said processing means for the operator determined period of time including means for eliminating any need to reboot said operating system in response to said keyboard switching whereby keyboard related electrical signals from only said single selected keyboard can be transmitted to said central processing means for the operator determined period of time.

4,965,561

CONTINUOUSLY VARIABLE COLOR OPTICAL DEVICE

Karel Havel, 15 Kensington Rd. Apt. #704, Bramalea Ontario, Canada L6T 3W2

Division of Ser. No. 922,847, Oct. 24, 1986, Pat. No. 4,845,481, which is a division of Ser. No. 817,114, Jan. 8, 1986, Pat. No. 4,647,217. This application Mar. 13, 1989, Ser. No. 322,341

The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.

Int. Cl.[5] G09G *3/14*

U.S. Cl. 340—762 **6 Claims**

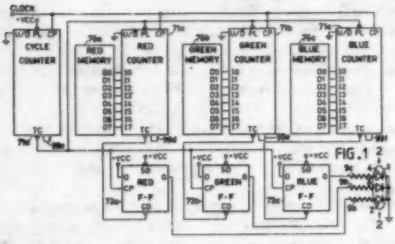


FIG. 1

1. A method of controlling a color of a variable color optical device which comprises a plurality of light sources for emitting upon activation light signals of respectively different primary colors and means for combining said light signals to obtain a composite light signal of a composite color, by repeatedly substantially simultaneously activating said light sources for brief time intervals by pulses of a substantially constant amplitude to cause them to emit light signals of said primary colors, and by selectively controlling durations of the time intervals of activation of respective light sources to control the portions of said primary colors, to thereby control the color of said composite light signal.

4,965,562

ELECTROSCOPIC DISPLAY DEVICE

Antonius G. H. Verhulst, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 6, 1988, Ser. No. 191,297

Claims priority, application Netherlands, May 13, 1987, 8701138

Int. Cl.[5] G09G *3/00*

U.S. Cl. 340—783 **9 Claims**

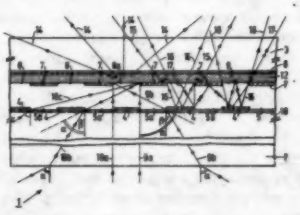
1. A display device comprising

(a) first and second separated, radiation-transparent supporting plates,

(b) a plurality of display elements disposed between said supporting plates, each of said display elements including at least one fixed electrode and at least one movable electrode, said movable electrode being movable relative to said fixed electrode by electrostatic forces, and said movable electrode having two end positions determined by abutment faces, said fixed electrodes and movable electrodes defining a pattern of radiation-transparent apertures,

(c) an electrically insulating layer disposed between said fixed electrodes and said movable electrodes,

(d) a pattern of areas being non-transparent to radiation and being disposed on said fixed electrodes, said pattern of areas being substantially identical in size to said pattern of radiation-transparent apertures, wherein coplanar disposition of said pattern of radiation-transparent apertures and said pattern of areas substantially prevents passage of radiation by said fixed and said movable electrodes,



(e) luminescent material disposed on one of said first and second radiation-transparent supporting plates at a viewing side, said luminescent material being disposed between said first and second radiation-transparent supporting plates adjacent to and facing said electrodes,

(f) radiation source means at a side opposite to said viewing side for emitting radiation of a sufficiently short wavelength to excite said luminescent material, and

(g) reflective surfaces disposed on at least one of said fixed electrodes or said movable electrodes at sides facing said luminescent material to reflect radiation emitted by said luminescent material in a direction to increase passage of radiation through said viewing side.

4,965,563

FLAT DISPLAY DRIVING CIRCUIT FOR A DISPLAY CONTAINING MARGINS

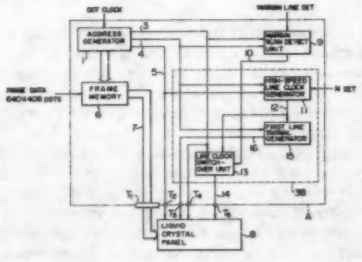
Hiroyuki Mano, Yokohama; Kiyoshige Kinugawa, Chiba, and Satoru Tsunekawa, Tachikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 27, 1988, Ser. No. 249,993

Claims priority, application Japan, Sep. 30, 1987, 62-243711

Int. Cl.[5] G09G *3/20*

U.S. Cl. 340—784 **8 Claims**



1. A flat display driver in a drive circuit for driving a flat display including:

a memory for storing data to be displayed on a display panel of a line scan type having a two-dimensional structure with N rows by M columns;

means for generating a read address of said memory and a line clock signal;

a data output terminal for supplying the display panel of the two-dimensional line scan type with data read from said memory;

a line clock signal output terminal for supplying the line clock signal from said read address generating means to the display panel wherein said memory is loaded at least with display data for K rows by M columns (K<N), said driver further including:

a margin scan detect device in which respective margin lines ((N−K)/2) in upper and lower portions of the display panel are set in advance for receiving and for counting the line clock signal from said read address generating means, thereby generating a margin detect signal when the count is equal to a value corresponding to a predetermined value; and

a margin display output device operative in response to an input of the margin detect signal from said margin detect device for outputting a margin display signal to the display panel, wherein said margin display output device includes:

means for generating a high-speed line clock signal having a frequency higher than a frequency of the line clock signal output from said read address generating means; and

line clock switch means connected to said read address generating means and said high-speed line clock generating means for effecting a switching operation from the line clock signal to the high-speed line clock signal when the margin detect signal is output from said margin scan detect means so as to supply the high-speed line clock signal to said line clock signal terminal.

4,965,564

DISPLAY APPARATUS WITH LIQUID CRYSTAL CELLS, PREFERABLY FOR MOTOR VEHICLES

Ehrenfried Fabry, Nuremberg; George Goddard, Wendelstein, and Dieter Meyer, Feucht, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

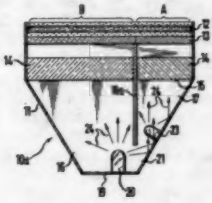
PCT No. PCT/DE87/00154, § 371 Date Dec. 16, 1988, § 102(e) Date Dec. 16, 1988, PCT Pub. No. WO88/01399, PCT Pub. Date Feb. 25, 1988

PCT Filed Apr. 7, 1987, Ser. No. 301,882

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1986, 3627697

Int. Cl.[5] G09G *3/36*

U.S. Cl. 340—784 **7 Claims**



1. A display apparatus for displaying signs indicative of measured values, functions, conditions and disturbances in a motor vehicle, comprising

a housing having a relatively large, open top portion, a relatively small, closed bottom wall, and sloping lateral walls for connecting said bottom wall with said top portion, said lateral walls having a light reflecting inner surface;

a liquid crystal display panel arranged in said top portion to display said signs;

a partition extending between said bottom wall and said top portion to divide the interior of said housing into compartments;

a first light source consisting of a single lamp arranged on said bottom wall in one of said compartments to radiate light of a given coloration against the inner surface of the sloping walls in said one compartment and against an area of said liquid crystal display panel;

a second light source consisting of a single lamp arranged in another compartment to radiate light of a different coloration against the inner surface of the sloping walls in said other compartment and against another area of said liquid crystal display panel delimited by said upright partition; and said partition extending from said liquid crystal display panel to a level above said bottom wall to permit a portion of light from said first light source to radiate against the inner surface of said sloping walls in said other compartment.

4,965,565

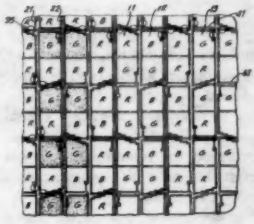
LIQUID CRYSTAL DISPLAY PANEL HAVING A THIN-FILM TRANSISTOR ARRAY FOR DISPLAYING A HIGH QUALITY PICTURE

Kesao Noguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 6, 1988, Ser. No. 190,799

Int. Cl.[5] G09G *3/00*

U.S. Cl. 340—784 **9 Claims**



1. A thin-film transistor array for a liquid crystal display panel comprising:

an insulating substrate;

a plurality of pixel electrodes formed on said insulating substrate in two orthogonal directions, said pixel electrodes having source regions;

a plurality of drain buses formed on said insulating substrate between said pixel electrodes in one of said orthogonal directions, each of said drain buses having a plurality of drain regions;

a plurality of gate buses formed on said insulating substrate between said pixel electrodes in the other of said orthogonal directions, each of said gate buses having a plurality of branch gate regions; and

a plurality of semiconductor films formed between said gate regions, said source regions and said drain regions to form therewith a plurality of thin-film transistors, of which some transistors extend along each of said gate buses and some transistors extend along each of said drain buses,

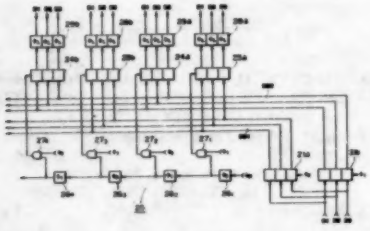
wherein directions of the branch gate regions of the thin-film transistors which are formed along each of said gate buses are repeatedly changed from said one of said orthogonal directions to the other of said orthogonal directions and vice versa and changes being repeated with every first predetermined number of the film transistors formed along said each of said gate buses, and wherein directions of the branch gate regions of the thin-film transistors which are formed along each of said drain buses are repeatedly changed from said one of said orthogonal directions to the other of said orthogonal directions and vice versa and changes being repeated with every second predetermined number of the thin film transistors which are formed along each of said drain buses.

4,965,566

SIGNAL ELECTRODE DRIVE CIRCUIT FOR IMAGE DISPLAY APPARATUS OPERABLE UNDER LOW FREQUENCY

Masao Kawamura, and Minoru Usui, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1988, Ser. No. 276,410
Claims priority, application Japan, Nov. 30, 1987, 62-302723
Int. Cl.[5] G09G 3/20
U.S. Cl. 340—793 10 Claims



1. A signal electrode drive circuit for an image display apparatus having a number of signal electrodes to which gradation signals representing picture elements to be reproduced by the apparatus are applied, comprising:

data supplying means for supplying a digital video signal having a horizontal scanning period;

a first buffer circuit for fetching the digital video signal supplied from said data supplying means in response to periodic second clock signals;

a second buffer circuit for fetching the digital video signal supplied from said data supplying means in response to periodic first clock signals of a phase different from said second clock signals;

pulse generating means for generating a pulse in synchronism with the horizontal scanning period of said digital video signal;

a 2K-stage shift register, wherein K is a integer, including K odd-number stage flip-flops for reading data in response to said second clock signals, and K even-number stage flip-flops for reading data in response to said first clock signals and serially connected with the K odd-number stage flip-flops in an alternating manner, and wherein the first stage of said 2K-stage shift register is responsive to said pulse from said pulse generating means;

K first AND gate circuit means for receiving the outputs from said odd-number stage flip-flops of the shift register and said first clock signals, and for outputting corresponding logical signals;

K second AND gate circuit means for receiving the outputs from said even-number stage flip-flops of the shift register and said second clock signals, and for outputting corresponding logical signals;

K first latch circuits for latching data that has been read in said first buffer circuit in response to the logical signals from corresponding ones of the first gate circuit means;

K second latch circuits for latching data that has been read in said second buffer circuit in response to the logical signals from corresponding ones of the second gate circuit means; and

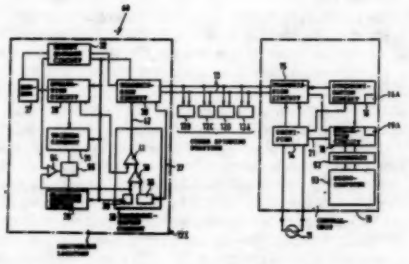
reading means for reading 2K pieces of video data that are latched within a certain time period by both of said first and said second latch circuits, for driving 2K signal electrodes of the image display apparatus with said 2K pieces of video data.

4,965,567

METHOD OF, AND APPARATUS FOR, TRANSMITTING DATA IN A MANUFACTURING MACHINE COMPRISING A PLURALITY OF PRODUCTION STATIONS

Urs Meyer, Niederglatt, Switzerland, assignor to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Dec. 22, 1988, Ser. No. 288,179
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744208
Int. Cl.[5] G05B 23/02; D01H 13/18
U.S. Cl. 340—825.16 33 Claims



1. A method of transmitting data in a manufacturing machine, particularly yarn manufacturing machine, containing a plurality of production stations, a plurality of monitoring sensors located at respective monitoring locations of respective ones of said plurality of production stations, and a central control unit communicating with said plurality of production stations, said method comprising the steps of:

presetting a predetermined starting point at the central control unit for starting data transmission between the central control unit and the plurality of production stations;

generating at the central control unit a modulated supply voltage comprising a plurality of consecutive sections starting from said predetermined starting point;

applying said plurality of consecutive sections of said modulated supply voltage from said central control unit to common conductor means to which all of the plurality of production stations are connected in parallel, and thereby applying said plurality of consecutive sections of said modulated supply voltage to all of the production stations;

counting, from the starting point preset by said central control unit, the number of said plurality of consecutive sections of said modulated supply voltage at each one of said plurality of production stations and at said central control unit in order to thereby synchronize said central control unit and said plurality of production stations;

generating respective reference numbers at each one of said plurality of production stations;

comparing said respective reference numbers and said number of said plurality of consecutive sections of said modulated supply voltage counted at each one of said plurality of production stations and allocating said plurality of consecutive sections of said modulated supply voltage to respective ones of said plurality of production stations having a reference number equal to the counted number of consecutive sections of said modulated supply voltage;

detecting the occurrence of a predetermined event at related ones of said plurality of monitoring sensors located at respective monitoring locations of associated ones of said plurality of production stations;

generating through said related monitoring sensors at said associated production stations, respective markings indicative of the occurrence of said predetermined event in the allocated sections of the modulated supply voltage during the time such allocated sections are applied to said associ-

ated production stations and thereby producing marked sections of said plurality of consecutive sections of said modulated supply voltage;

sensing said markings of said marked sections at said central control unit via said common conductor means; and

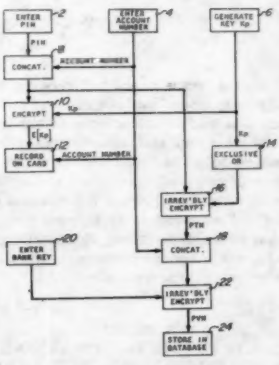
identifying, at said central control unit and as a result of counting the number of said plurality of consecutive sections of said modulated supply voltage in said central control unit, said marked sections in said plurality of consecutive sections of said modulated supply voltage and thereby identifying said associated production stations at which said predetermined event has been detected.

4,965,568

MULTILEVEL SECURITY APPARATUS AND METHOD WITH PERSONAL KEY

Martin M. Atalla, 18 Monte Vista Ave., Atherton, Calif. 94025, and Webster D. Hopkins, 2425 Rick Dr., Morgan Hill, Calif. 95020

Filed Mar. 1, 1989, Ser. No. 317,676
Int. Cl.[5] H04Q *5/00*; H04L *9/00*
U.S. Cl. 340—825.340 **6 Claims**



1. A method for encoding a card assigned by an entity to an individual for use in completing secured transactions with respect to an account number indicated on the card, the method comprising the steps of:

generating a personal key code assigned to the individual;

forming an encoded combination of the account number and a secret code received from the individual;

forming an encrypted personal key as a logical combination of the personal key code and said encoded combination;

encoding the card with a detectable code representative of said encrypted personal key;

combining in accordance with an irreversible logical encoding combination said encoded combination and the personal key code to produce a personal identification transmission code;

combining in accordance with a second logical encoding combination the personal identification transmission code and account number and an institutional key code associated with the entity to produce a personal identification verification code; and

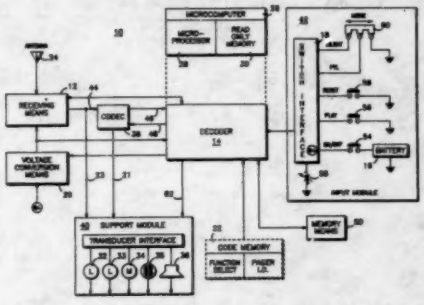
storing the personal identification verification code for subsequent retrieval.

4,965,569

DIGITIZED STORED VOICE PAGING RECEIVER

Paul T. Bennett, Phoenix, Ariz.; David F. Willard, Plantation, Fla.; Omid Tahernia, Coconut Creek, Fla.; James C. Page, Lake Worth, Fla.; Alan I. Spiro, Boynton Beach, Fla., and Frank E. Lambrecht, Miramar, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 68,682, Jun. 30, 1987, abandoned. This application Mar. 14, 1989, Ser. No. 323,056
Int. Cl.[5] H04Q *7/00*
U.S. Cl. 340—825.440 **23 Claims**



1. A method of operating a paging receiver which receives information, transmitted from an external source, including coded information having an address, followed by associated analog information having at least one analog voice message, said method comprising the steps of:

(a) receiving the information and decoding the coded information to recover the address;

(b) selectively enabling the receiver correlating to the decoded address to recover the analog voice message from the received analog information;

(c) responding solely to the presence of the recovered analog voice message to convert said analog voice message to digital information, the digital information representative of a replica of the originally received analog voice message; and

(d) storing at least part of the digital information in a memory of the selected receiver.

4,965,570

PHOTOELECTRIC CONVERSION APPARATUS

Katsunori Hatanaka, Yokohama; Shunichi Uzawa, Tokyo; Katsumi Nakagawa, Nagahama, and Toshiyuki Komatsu, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 251,029, Sep. 26, 1988, abandoned, which is a continuation of Ser. No. 8,943, Jan. 30, 1987, abandoned. This application Aug. 2, 1989, Ser. No. 388,713
Claims priority, application Japan, Feb. 4, 1986, 61-23284; Feb. 4, 1986, 61-23285; Feb. 4, 1986, 61-23286; Feb. 4, 1986, 61-23287; Feb. 4, 1986, 61-23288
Int. Cl.[5] H04Q *1/00*
U.S. Cl. 340—825.790 **8 Claims**

1. Apparatus for a photoelectric conversion device having a signal accumulated in a capacitor provided for each of a plurality of photoelectric conversion elements, signal lines extending from the capacitors, comprising:

a matrix wiring unit arranged opposite the photoelectric conversion elements so as not to cross the signal lines extending from said capacitors, for transferring the signals from said capacitors; and

switch array means for serially outputting the transferred signals, said switch array means comprising:

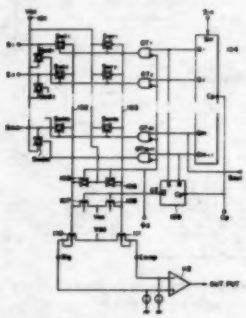
(a) signal switch means having a plurality of inputs for

receiving the transferred signals, said signal switch means being connected to a signal output line;

(b) reference switch means connected to a reference output line;

(c) differential amplifier means coupled to said signal output line and to said reference output line for receiving a first voltage signal outputted from said signal switch means and a second voltage signal outputted from said reference switch means, and for outputting an output signal that corresponds to signal levels of the transferred signals;

(d) voltage reset means connected to said signal output line and to said reference output line;



(e) voltage responsive signal read-out means coupled between said differential amplifier means and said signal output line for conducting voltage-reading of an output of said signal output line; and

(f) voltage responsive reference read-out means coupled between said differential amplifier means and said reference output line for conducting voltage-reading of an output of said reference output line; and

wherein said signal switch means and said reference switch means are synchronously operated so that the output read by said voltage responsive signal read-out means and the output read by said voltage responsive reference read-out means are inputted into said differential amplifier means.

4,965,571

GARAGE PARKING GUIDE

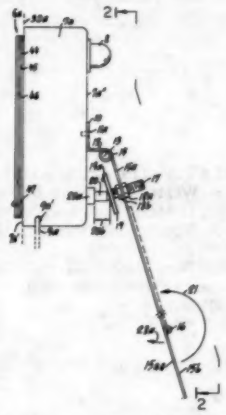
John W. Jones, 25 Fairbanks La., Basking Ridge, N.J. 07920

Filed Jun. 1, 1989, Ser. No. 360,114

Int. Cl.[5] B60Q *11/00*

U.S. Cl. 340—932.2 **8 Claims**

1. In a motor vehicle garage-parking driver-indicator guide-device for visually signifying at-least prior to engagement of a motor vehicle when it is safe and alternatively after engagement of a motor vehicle whenever it has become not safe for a motor vehicle to move further toward a parking location, including support structure mounting a signaling means for displaying a signal viewable by a driver of a motor vehicle to be advanced forwardly toward the signaling means, and an actuating lever adapted to be actuated, manipulated or moved by an advancing motor vehicle, the improvement comprising said signaling means adapted for mounting in a position where viewable throughout garage parking of a motor vehicle and being in a first position or first state of being such that the signaling means is viewable to the driver as and indicative of existing authorization or approval for continued forwardly-advancing motion by the motor vehicle up to a second predetermined advanced position at which the motor vehicle eventually is actuatable of the activating lever to become moved to or beyond said second predetermined position or an inactivated state of being such that an advance-authorizing signal means no longer exists or is nonviewable, said signaling means being at least one visually-discernible electric light and electrical circuitry therefor providing electrical power thereto and inclusive of a normally-closed switch and switch lever thereof operatively connected to said actuating lever to open said normally-closed switch thereby for deactivating electrification of said visually-diiscernible electric light to an unlighted state whenever said motor vehicle reaches or has reached or has been moved beyond said second predetermined advanced position or said inactivated state, whereby a turning-off of the electric light is indicative to the driver of the motor vehicle that further advancement of the motor vehicle should be terminated, and a spring means connected between said support structure and at-least one of said switch lever and said actuating lever such that said switch lever is biased to a normally closed position whenever said actuating lever has not been physically moved to or past said second predetermined advanced position or said inactivated state, and lever adjustment means for intermittently adjusting the position or angle or orientation of the actuating lever forwardly or rearwardly relative to and substantially along an imaginary line of advancement of a motor vehicle potentially intended to contact and move or actuate said actuating lever.



4,965,572

METHOD FOR PRODUCING A WARNING OF THE EXISTENCE OF LOW-LEVEL WIND SHEAR AND AIRCRAFTBORNE SYSTEM FOR PERFORMING SAME

Hugh P. Adamson, Boulder, Colo., assignor to Turbulence Prediction Systems, Boulder, Colo.

Filed Jun. 10, 1988, Ser. No. 204,865

Int. Cl.[5] G08B *21/00*

U.S. Cl. 340—968 **50 Claims**

1. A method for producing a warning of the possible existence of low-level wind shear comprising the steps of:

(A) measuring air speed, A_s, from on-board an aircraft;

(B) measuring a first temperature, T_m, from on-board the aircraft where said first temperature corresponds to the outside air temperature near the aircraft;

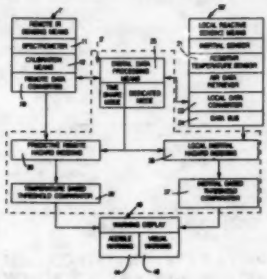
(C) measuring a second temperature, T, where said second temperature is the temperature of the air a predetermined distance remote from the aircraft;

(D) determining the difference, ΔT, between the first and second temperatures;

(E) determining the value of a hazard factor which is a function of at least (a) a first term which is a linear function of at least ΔT and (b) a second term which is a non-linear function of at least ΔT and T_m and an inverse function of at least A_s;

(F) comparing the determined hazard factor F with a predetermined threshold value, F_T, representing the maximum

value of F permissible, based upon the performance capabilities of the aircraft; and



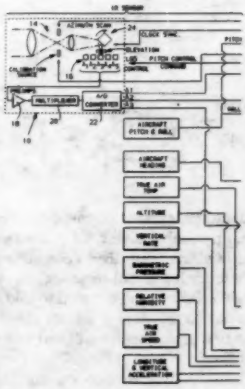
(G) issuing a warning if the determined value of F exceeds F_T to thus provide a warning to the aircraft of the possible existence of low-level wind shear at said predetermined distance from the aircraft.

4,965,573

FORWARD LOOKING WINDSHEAR DETECTION SYSTEM

Brian J. Gallagher, Elmgrove; Wayne A. Schaefer, New Berlin, both of Wis., and Peter P. Klein, Goleta, Calif., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Oct. 3, 1988, Ser. No. 252,732
Int. Cl.[5] G08B *23/00*
U.S. Cl. 340—968 **6 Claims**



1. A method of estimating the range of a microburst ahead of an aircraft comprising the steps of scanning the atmosphere in front of the aircraft over a predetermined azimuth angle, simultaneously detecting infrared radiation at wavelengths λ_1 and λ_2 and calculating the range to the microburst in accordance with the following equation

$$r_o \simeq -\frac{\ln\left[\dfrac{\Delta W_{f1} W_b(\lambda_2, T)[1 - e^{-(\sigma a2 + \sigma r2)L}}{\Delta W_{f2} W_b(\lambda_1, T)[1 - e^{-(\sigma a1 + \sigma r1)L}]}\right]}{\sigma_{a1} - \sigma_{a2}}$$

where

r_o is the range to the microburst

ΔW_{f1} is the difference between radiation at a first infrared wavelength λ_1 and at a reference wavelength λ

ΔW_{f2} is the difference between radiation at a second infrared wavelength $\lambda 2$ and at a reference wavelength λ

T is the ambient temperature

L is the width of the microburst

$W_b(\lambda_f, T)$ is the black body radiance at wavelength, λ_f

σ_{af} is the atmospheric extinction at λ_f

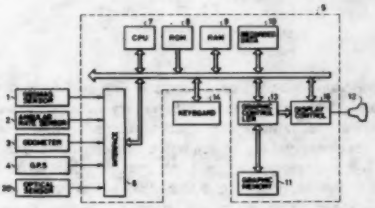
σ_{rf} is the increase in extinction in the microburst due to additional moisture and rain particles.

4,965,574

VARIABLE-BRIGHTNESS DISPLAY FOR USE IN A NAVIGATION SYSTEM FOR A VEHICLE

Atsuhiko Fukushima; Takashi Kashiwazaki; Masayuki Hosoi, and Hitoshi Ando, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 30, 1987, Ser. No. 114,981
Claims priority, application Japan, Oct. 30, 1986, 61-259225
Int. Cl.[5] G09G *1/28;* H04N *5/58*
U.S. Cl. 340—995 **5 Claims**



1. A display device, comprising:

a display disposed in an ambient brightness;

means for generating a brightness signal indicating a degree of said ambient brightness;

means for displaying information and a background on said display device, said displaying means including a plurality of registers having data for determining a brightness of said displayed information and of said displayed background, and the brightness of said information and said background is displayed by said displaying means according to the contents of said registers; and

means for controlling said registers so as to change the contents thereof in accordance with said generated brightness signal.

4,965,575

DATA ALIGNMENT CIRCUIT AND METHOD FOR SELF-CLOCKING ENCODED DATA

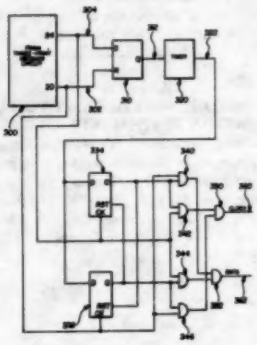
Michael L. Wash, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 7, 1988, Ser. No. 255,578
Int. Cl.[5] H03M *5/14*
U.S. Cl. 341—72 **3 Claims**

1. In a binary data encoding and decoding system which generates a train of clock and data pulses, each pulse consisting of first and second edges, wherein one of two binary states is represented by the location of said second edge between said first edge of said pulse and the first edge of the next succeeding pulse in said train, and wherein said first edge is one of a positive-going edge or a negative-going edge, while said second edge is the other, a system for consistently defining said first and second edges as respective ones of said positive- and negative-going edges, said system comprising:

an encoding system means for transforming binary data into said train of pulses, said encoding system including means for transmitting, during a periodic hiatus in said train of pulses, an alignment mark waveform having no transitions

for a period of time corresponding to that typically occupied by at least two of said pulses, followed by a defining edge which is either one of a positive-going edge or a negative-going edge, said alignment mark waveform identifying the first and second edge polarity convention for the train of pulses; and



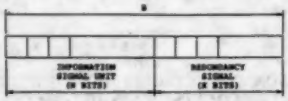
a decoding system means for receiving said train of pulses and transforming them into binary data, said decoding system including means for detecting said alignment mark waveform and for associating a predetermined one of said first and second edges with said defining edge during subsequent decoding operations, so as to consistently define said first and second edges as respective ones of said positive-going and negative-going edges.

4,965,576

ERROR CORRECTING SYSTEM CAPABLE OF EFFECTIVELY USING AN ALLOWABLE FREQUENCY BAND

Masayoshi Watanabe, and Seiichi Noda, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 27, 1988, Ser. No. 290,500
Claims priority, application Japan, Dec. 24, 1987, 62-328047
Int. Cl.[5] H03M *13/00*
U.S. Cl. 341—94 **4 Claims**



1. An encoder for encoding input information signal units into error correcting codewords, respectively, each of which can correct an error or errors on decoding each of the error correcting codewords and which is transmitted from said encoder through a transmission path having an allowable frequency band, said encoder comprising:

grouping means responsive to said input information signal units for grouping each input information signal unit into first through M-th information signal subunits on the basis of said allowable frequency band, where M is an integer greater than unity;

first through M-th encoding means coupled to said grouping means an individually supplied with said first through M-th information signal subunits, respectively, for individually encoding said first through M-th information signal subunits into first through M-th encoded signal units which include said first through M-th signal information subunits and first through M-th redundancy signal units, respectively; and

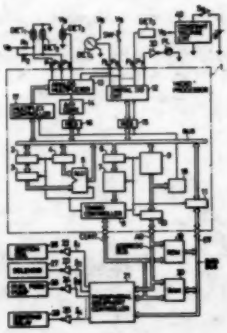
means for combining said first through M-th encoded signal subunits into a single one of said error correcting codewords.

4,965,577

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING A WIRING LAYOUT TO AVOID INTERSECTIONS BETWEEN ANALOG SIGNAL WIRING LAYERS AND DIGITAL SIGNAL WIRING LAYERS

Shiro Baba, Tokorozawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 420,877, Sep. 21, 1982, Pat. No. 4,875,047. This application Apr. 8, 1986, Ser. No. 849,283
Claims priority, application Japan, Sep. 21, 1981, 56-147894
Int. Cl.[5] H03M *1/14*
U.S. Cl. 341—141 **16 Claims**



1. A semiconductor integrated circuit device comprising:

an analog signal transmission link formed on a semiconductor substrate in a first prescribed geometrical pattern;

a first prescribed, analog signal-handling, electronic circuit formed on said substrate and coupled to said analog signal transmission link so that analog signals may be exchanged between said first prescribed circuit and said analog signal transmission link;

a digital transmission link formed on said substrate in a second prescribed geometrical pattern separated from said first prescribed geometrical pattern so as not to overlap said first pattern;

a second prescribed, digital signal-handling, electronic circuit formed on said substrate and coupled to said digital signal transmission link so that digital signals may be exchanged between said second prescribed circuit and said digital signal transmission link; and

at least one bonding pad electrode formed on said substrate at a position thereof separating said analog signal transmission link from said digital signal transmission link,

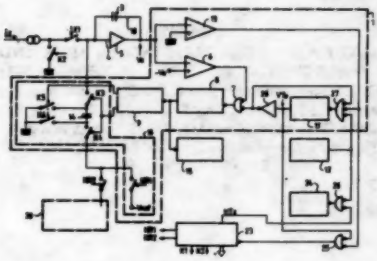
wherein said bonding pad electrode is arranged adjacent a peripheral portion of said substrate, and wherein said analog transmission link has a portion which is disposed along said peripheral portion of said substrate between an edge of said substrate and said bonding pad electrode.

4,965,578

HIGH DYNAMIC ANALOG TO DIGITAL COUNTER

Robert Poujois, Sinard, France, assignor to Commissariat a l'Energie Atomique, France

Filed Oct. 13, 1988, Ser. No. 257,051
Claims priority, application France, Oct. 21, 1987, 87 14535
Int. Cl.[5] H03M 1/60
U.S. Cl. 341—156 10 Claims



1. A high dynamic analog to digital converter, of the type comprising:

(a) a means to integrate a signal to be quantified during a period, said means capable of accumulating charges originating from the signal to be quantified;

(b) means to inject into the integration means quantified electric charges in a number proportional to said signal to be quantified, the injected charges being of a polarity inverse to the charges originating from the signal to be quantified, said injection means comprising a quantified charge generator provided with a quantization capacitor, firstly coupled to a reference voltage source of polarity opposite to that of the signal to be quantified;

(c) fine counting means for counting a period proportional to discharge of the accumulated residual charge and calculate from this a low order value quantization of the signal;

(d) said quantified charge generator and quantization capacitor, selectably switchable between the first reference voltage source and a ramp generator voltage source of polarity opposite to that of the signal to be quantified;

(e) rough counting means for counting the number of injected quantified charges and calculate from these a high value quantization of the signal;

(f) a triggered oscillator and control logic sequencer for alternatively coupling said quantization capacitor with the charge integrator input; and

(g) a sequencer for alternatively coupling the reference voltage source and ramp generator to said quantization capacitor.

4,965,579

N-BIT A/D CONVERTER UTILIZING N COMPARATORS

Gang Liu, Detroit; Hanchi Huang, Sterling Heights; Pepe Sly, Dearborn Heights, and Michael P. Polis, Grosse Pointe Park, all of Mich., assignors to The Board of Governors of Wayne State University, Detroit, Mich.

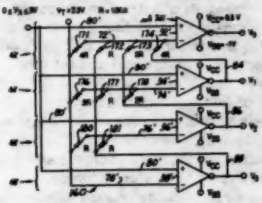
Filed Nov. 28, 1988, Ser. No. 276,700
Int. Cl.[5] H03M 1/36
U.S. Cl. 341—159 21 Claims

1. An asynchronous analog-to-digital converter for producing at least four binary outputs A_0 through A_3 in parallel from an analog input signal and a reference signal, the converter comprising:

at least first, second, third and fourth comparators respectively having and producing at least four binary outputs A_0, A_1, A_2 and A_3, where output A_0 and output A_3 are respectively the most significant and the least significant of the four binary outputs, each such comparator having a first input and a second input, each of such first inputs receiving the analog input signal, and the second input of the fourth comparator receiving the reference signal;

a first resistance network having an output mode N_0 connected to the second input of the first comparator, having four input nodes, and having four resistance elements each connected on one side thereof to the node N_0 and on the other side thereof respectively to a distinct one of these four input nodes, which four input nodes are respectively connected to the reference signal and outputs A_1, A_2 and A_3;

a second resistance network having an output node N_1 connected to the second input of the second comparator,



having three input nodes, and having three resistance elements each connected on one side thereof to the node N_1 and on the other side thereof respectively to a distinct one of these three input nodes, which three input nodes are respectively connected to the reference signal and outputs A_2 and A_3; and

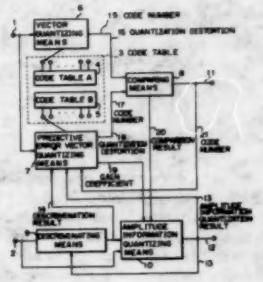
a third resistance network having an output mode N_2 connected to the second input of the third comparator, having two input nodes, and having two resistance elements each connected on one side thereof to the node N_2 and on the other side thereof respectively to a distinct one of these two input nodes, which two input nodes are respectively connected to the reference signal and output A_3.

4,965,580

QUANTIZER AND INVERSE-QUANTIZER

Hirohisa Tasaki, and Kunio Nakajima, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1989, Ser. No. 405,350
Claims priority, application Japan, Sep. 26, 1988, 63-242001; Sep. 28, 1988, 63-243201
Int. Cl.[5] H03M 7/36; H04N 7/137
U.S. Cl. 341—200 3 Claims



1. A quantizer and an inverse-quantizer for compressing an information amount using code tables each having a limited number (N) of code words, wherein

said quantizer comprises:

a code table which is constructed by M (M is a positive integer smaller than N) vector code words and (N-M) predictive error vector code words;

vector quantizing means for selecting an optimum vector code word which is closest to a present input vector to be quantized from among said M vector code words and for calculating its quantization distortion;

predictive error vector quantizing means for obtaining a predictive error vector between a predictive value of an input vector which was calculated from a quantization result of past input vectors and the present input vector, for selecting an optimum predictive error vector code word which is closest to the predictive error vector from among the (N-M) predictive error vector code words, and for calculating its quantization distortion; and

comparing means for selecting a code word which gives a smaller quantization distortion from said selected optimum vector code word and said selected optimum predictive error vector code words and for outputting a code number of said selected code word,

and wherein said inverse-quantizer comprises:

a code table which is constructed by M (M is a positive integer smaller than N) vector code words and (N-M) predictive error vector code words;

inverse-vector quantizing means which, when the code number inputted from said quantizer designates one code word among said M vector code words, outputs said designated one vector code word;

inverse-predictive error vector quantizing means which, when the code number inputted from the quantizer designates one code word among said (N-M) predictive error vector code words, outputs a result in which said designated one predictive error vector code word was added to the predictive value of the input vector; and

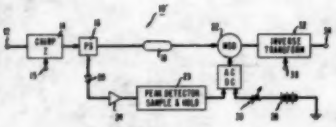
control means for switching between said inverse-vector quantizing means and said inverse-predictive error vector quantizing means on the basis of said code number.

4,965,581

REAL-TIME REJECTION CIRCUIT TO AUTOMATICALLY REJECT MULTIPLE INTERFERING HOPPING SIGNALS WHILE PASSING A LOWER LEVEL DESIRED SIGNAL

William J. Skudera, Jr., Oceanport, and Stuart D. Albert, Bricktown, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 8, 1990, Ser. No. 461,943
Int. Cl.[5] G01S *7/36*; H04B *1/10*
U.S. Cl. 342—19 **2 Claims**



1. A rejection circuit comprising:

an RF input terminal;

transform means for transforming a time domain RF signal on the RF input terminal into a frequency segregated time domain signal having frequency components separated in time, each said frequency component having a main lobe and two side lobes on either side of said main lobe;

a normally ON gate means for passing said time domain signal to an output; and

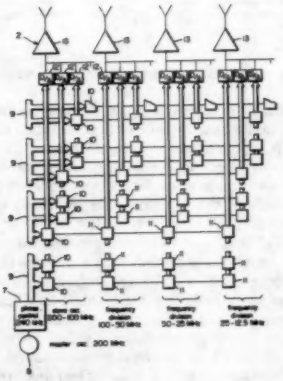
pulse means for causing strong frequency components in said time domain signal having a magnitude greater than a predetermined level to turn the gate means OFF for a period of time to substantially block the strong frequency components, said period of time being established by a peak detector-sample and hold circuit means and spanning the main and two side lobes.

4,965,582

METHOD FOR RADAR MAPPING AN AREA AND A RADAR EQUIPMENT TO CARRY OUT THE METHOD

Hans O. Hellsten, Palmaers gata 6, S-582 49 Linkoping, Sweden

Continuation-in-part of Ser. No. 893,294, Jul. 24, 1986, Pat. No. 4,866,446. This application Apr. 28, 1989, Ser. No. 344,952
Claims priority, application Sweden, Nov. 24, 1984, 8406007
Int. Cl.[5] G01S *13/90*
U.S. Cl. 342—25 **8 Claims**



1. A method for radar mapping an area with a synthetic aperture radar, SAR, with suppression of speckle and including mapping structures concealed by dielectrical layers, comprising the steps of:

generating in an equipment a radio frequency signal, which is distributed over a large relative bandwidth;

emitting the generated radio frequency signal towards the area during a simultaneous movement of the equipment over the area;

moving the equipment over the area under as constant conditions as possible with respect to height over the area, course and speed;

receiving the reflection of the emitted signal in the equipment;

calculating the reflectivity of the area by a tomographic method of inversion based upon the emitted signal, the received reflection and data concerning the movement of the equipment over the area, with the ground reflectivity defined as the scalar product between the direction of incidence of radiation hitting any particular point on the ground and the ground unit normal in that point; and

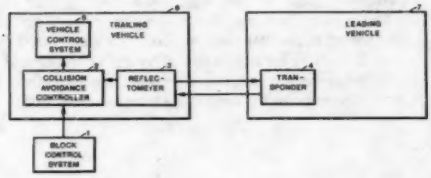
calculating the 2-dimensional divergence of the ground normal vector field by combining Fourier and a first order Hankel transforms of radar data, followed by a coordinate change from polar coordinates to rectangular coordinates in the frequency domain, followed by an inverse 2-dimensional Fourier transform, said 2-dimensional divergence of the ground normal vector field enables a ground topography contour map to be obtained.

4,965,583

COLLISION AVOIDANCE SYSTEM FOR AUTOMATICALLY CONTROLLED VEHICLES MOVING AT SHORT HEADWAYS

Charles Broxmeyer, 6851 Strata St., McLean, Va. 22101

Filed May 2, 1989, Ser. No. 346,582
Int. Cl.[5] G01S *13/76*; B61L *23/34*
U.S. Cl. 342—42 **11 Claims**



1. A collision avoidance system, for vehicles operating over a right of way, comprising:

block control means that register vehicle occupancy of a plurality of zones along the right of way and impose revocable restrictions on the operation of a trailing vehicle in a selected number of zones behind a zone occupied by a leading vehicle to protect said trailing vehicle against collision with said leading vehicle;

vehicle control means to measure the distance between said trailing vehicle and said leading vehicle, and further comprising means to restrict the operation of said trailing vehicle in accordance with the measured distance between said trailing vehicle and said leading vehicle to protect said trailing vehicle against collision with said leading vehicle;

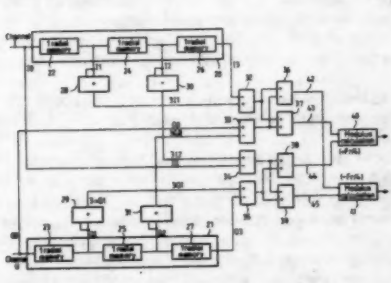
means to revoke said revocable restrictions imposed by said block control means with respect to operation of said trailing vehicle when said trailing vehicle is protected against collision in accordance with said measured distance between said trailing vehicle and said leading vehicle, said vehicle control means located in each said vehicle remaining continuously invoked.

4,965,584

METHOD AND DEVICES FOR TRANSLATION ALONG THE AXIS OF FREQUENCIES OF THE MODULUS OF THE TRANSFER FUNCTION OF A FILTER

Jean-Pol Coulmier, Sevres; Guy Lepere, Le Mesnil Esnard, and Jacques Kunegel, Paris, all of France, assignors to Thomson CSF, Paris, France

Filed Mar. 20, 1989, Ser. No. 325,586
Claims priority, application France, Mar. 18, 1988, 88 03524
Int. Cl.[5] G01S *13/53, 13/52*
U.S. Cl. 342—159 **6 Claims**



1. A method for frequency-shifting by a value Fd a modulus of a transfer function of a transversal filter having n cells with respective first multiplication coefficients KO . . . Ki . . . Kn, comprising the steps of:

applying samples having a repetitions period Tr to said transversal filter; and

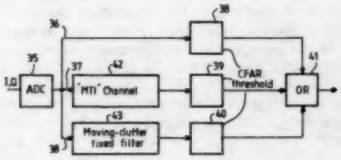
multiplying each of said first multiplication coefficients Ki of order i by a factor $e^{j(n-1)r}$, wherein i varies from 0 to n and $r=2\pi Fd\cdot Tr$, to thereby provide second multiplication coefficients K'O . . . K'i . . . K'n.

4,965,585

DEVICE FOR MOVING-CLUTTER ELIMINATION IN A RADAR

Guy Lepere, Le Mesnil Esnard; Jacques Kunegel, Paris, and Jean-Pol Coulmier, Sevres, all of France, assignors to Thomson CSF, Paris, France

Filed Mar. 8, 1989, Ser. No. 321,420
Claims priority, application France, Mar. 18, 1988, 88 03523
Int. Cl.[5] G01S *13/526, 13/53*
U.S. Cl. 342—160 **7 Claims**



1. A device for eliminating the moving clutter with a Doppler shift Fd in a coherent pulse Doppler radar with pulse repetition frequency Fr comprising:

a first processing channel having a fixed-clutter elimination transversal filter using (n+1) first multiplication coefficients A0, A1, . . . , Aα, . . . , An followed by a threshold circuit;

a second processing channel having only a threshold circuit;

a third processing channel having a moving-clutter elimination transversal filter, said transversal filter comprising a bank of multiplying circuits having a set of fixed second multiplication coefficients K or K' which are derived from the first multiplication coefficients A0, A1, . . . , Aα, . . . , An of said fixed-clutter elimination transversal filter in said first processing channel by multiplying the first multiplication coefficients A0, A1, . . . , Aα, . . . , An by a factor Fα:

$$F\alpha = e^{j2\pi Fd \times Tr(n-\alpha)},$$

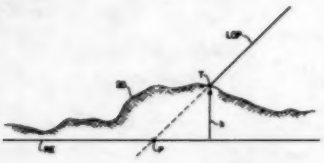
where Tr is a pulse repetition period, n is one less than the number of first multiplication coefficients A0, A1, . . . , Aα, . . . , An, and α is an order of a particular first multiplication coefficient A0, A1, . . . , Aα, . . . , An; and

an OR circuit, coupled to receive said first, second, and third processing channel, having an output indicative of a processed signal.

4,965,586
POSITION DETERMINATION AND MESSAGE TRANSFER SYSTEM EMPLOYING SATELLITES AND STORED TERRAIN MAP

Gerard K. O'Neill, Princeton, N.J., assignor to Geostar Corporation, Washington, D.C.

Continuation of Ser. No. 641,385, Aug. 16, 1984, Pat. No. 4,839,656. This application Oct. 31, 1988, Ser. No. 264,810
The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.
Int. Cl.[5] G01S 5/14
U.S. Cl. 342—357 **24 Claims**



1. A system for determining the position of a user located on the earth's surface, comprising:

a user-carried transceiver for receiving an interrogation signal and transmitting a reply signal in response to said interrogation signal;

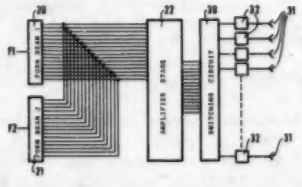
two satellites at spaced orbital locations above the earth, each of said satellites carrying repeater means for receiving and retransmitting the reply signal transmitted by the user-carried transceiver; and

a ground station for periodically transmitting the interrogation signal and for receiving and processing the retransmitted reply signals from the two satellites, said ground station including means for calculating the user position based on the arrival times of the retransmitted reply signals at the ground station, the transmission time of the interrogation signal from the ground station, and the elevation of the user on the earth's surface, said elevation being derived form a stored terrain map providing local terrain elevations at a plurality of points on the earth's surface.

4,965,587
ANTENNA WHICH IS ELECTRONICALLY RECONFIGURABLE IN TRANSMISSION

Régis Lenormand, Toulouse; Marcel Billand, Noé ; Pierre Fraise, Frouzins; Jean-Claude Goupil, Plaisance du Touch; Gérard Raguenet, Labarthe sur Leze, and Didier René, Toulouse, all of France, assignors to Societe Anonyme dite: Alcatel Espace, Courbevoie, France

Filed Mar. 20, 1989, Ser. No. 325,796
Claims priority, application France, Mar. 18, 1988, 88 03547
The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.
Int. Cl.[5] G01S 7/03
U.S. Cl. 342—372 **4 Claims**



1. An antennna which is electronically reconfigurable in transmission, the antenna comprising an arraya of elementary sources, feed and control electronics, and an energy-focusing reflector, with the array being situated in the focal zone of said reflector, said feed and control electronics comprising:

m beam-forming circuits each including a set of adjustble phase shifters and a set of adjustable attenuators with each beam-forming circuit synthesizing a respective one of m beams;

means for combining outputs from said beam forming circuits to obtain a set of combined signals;

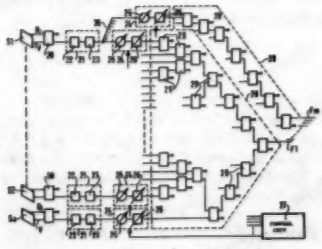
an amplifier stage for receiving and amplifying said combined signals, said amplifier stage comprising amplifiers connected in parallel and followed by a generalized coupler formed by an association of hybrid couplers; and

a switching circuit which interconnects the outputs from the amplifier stage to the radiating elements of the array.

4,965,588
ELECTRONICALLY SCANNED ANTENNA

Régis Lenormand, Toulouse; Antoine Clérino, Cugnaux; Jacques Néron, Toulouse; Jean-Philippe Marre, Cugnaux, and Gérard Raguenet, Portet S/Garonne, all of France, assignors to Societe Anonyme dite : Alcatel Espace, Courbevoie, France

Filed Mar. 20, 1989, Ser. No. 325,716
Claims priority, application France, Mar. 18, 1988, 88 03544
The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.
Int. Cl.[5] G01S 7/03
U.S. Cl. 342—372 **6 Claims**



1. An electronically scanned antenna including an array of elementary sources, feed and control electronics and an energy-focusing reflector with the array being situated in the focal zone of the reflector, the feed and control electronics comprising:

hybrid couplers each corresponding to a respective one of the elementary sources and each providing a coupler output;

amplifier circuits for amplifying said coupler outputs;

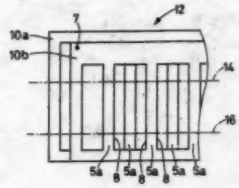
beam-forming circuits receiving the amplified coupler outputs as inputs and adjusting the amplitude and phase thereof, each said beam forming circuit constituted by an adjustable phase shifter and an adjustable attenuator individually controlled by a control unit; and

at least one combiner constituted by a set of hybrid junctions for combining outputs of said beam forming circuits to deliver a useful output signal corresponding to a given beam.

4,965,589
RECORDING HEAD HAVING SPACED-APART ELECTRODES

Yukihisa Takeuchi, and Azuma Yamamoto, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jun. 15, 1989, Ser. No. 366,499
Claims priority, application Japan, Jun. 17, 1988, 63-150885; Jul. 8, 1988, 63-171100; Apr. 27, 1989, 1-108091
Int. Cl.[5] G01D *15/10*
U.S. Cl. 346—76 PH 13 Claims



1. A recording head operable to apply an electric current, comprising an array of recording electrodes in the form of strips which are substantially equally or regularly spaced apart from each other in a direction perpendicular to lengths of the strips, by a distance smaller than a thickness of said strips, such that said strips lie in substantially the same plane parallel to said direction, said strips consisting of at least parts of generally elongate electrode portions of a plurality of electrically conductive sheets superposed on each other in a predetermined relative position into an electrode assembly, said elongate electrode portions of each of said electrically conductive sheets being defined by a plurality of apertures whose width is larger than a thickness of said each electrically conductive sheet, said elongate electrode portions of said plurality of electrically conductive sheets cooperating with each other to define a plurality of slits whose width is smaller than said thickness of said each electrically conductive sheet, said electrode portions of said electrode assembly as said strips being spaced apart from each other by the width of said plurality of slits.

4,965,590
IMAGE PRINTING APPARATUS

Shigeru Yamazaki, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 15, 1988, Ser. No. 284,536
Claims priority, application Japan, Dec. 17, 1987, 62-317480; Sep. 3, 1988, 63-221153
Int. Cl.[5] G01D *9/42, 15/24*
U.S. Cl. 346—108 12 Claims

1. An image printing apparatus comprising:

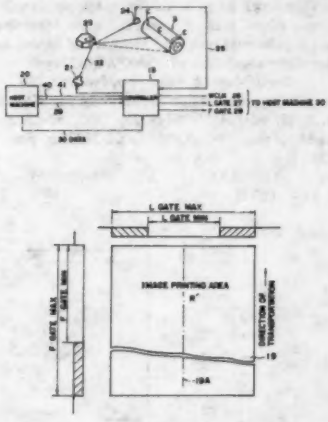
recording means for optically recording an image on a recording medium for every scanning line in synchronism with a write clock signal, by turning ON/OFF a light source included therein in accordance with an image signal supplied thereto;

printing means for printing said image formed on said recording medium on paper while transporting said paper;

first write-width determining means for determining a first write-width in a first direction of said paper by using paper size information for said paper and a first counted value obtained by counting said write clock signal;

second write-width determining means for determining a second write-width in a second direction of said paper by using said paper size information and a second counted value obtained by counting a number of the recording performed for every scanning line, the second direction being perpendicular to the first direction and corresponding to a direction of a paper transportation; and

controlling means for controlling said image signal supplied to said light source so as to be recorded on an area of said recording medium corresponding to an area on said paper

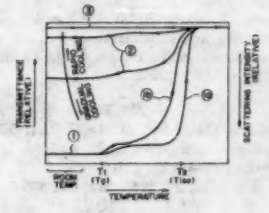


defined by the first and second write widths supplied from the first and second write-width determining means.

4,965,591
RECORDING WITH POLYMER LIQUID CRYSTAL RECORDING MEDIUM

Yutaka Kurabayashi, Yokohama; Toshikazu Ohnishi, Atsugi; Kazuo Yoshinaga, Machida; Akihiro Mouri, Atsugi; Kazuo Isaka, Tokyo; Shuzo Kaneko, Yokohama; Takeo Eguchi, Atsugi, and Yomishi Toshida, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1988, Ser. No. 241,214
Claims priority, application Japan, Sep. 8, 1987, 62-223147; Dec. 10, 1987, 62-310848; Dec. 18, 1987, 62-318929; Dec. 29, 1987, 62-336128; Jan. 25, 1988, 63-012639
Int. Cl.[5] G01D *15/16*
U.S. Cl. 346—108 10 Claims



1. A recording apparatus, including:

a recording medium comprising a polymer liquid crystal layer capable of assuming a transparent state or an opaque state;

first heating means for heating the polymer liquid crystal layer to a temperature below the isotropic transition temperature of the polymer liquid crystal layer; and

second heating means for heating the polymer liquid crystal layer to a temperature above the isotropic transition temperature, thereby forming a written part therein.

4,965,592

IMAGE PROCESSING APPARATUS FOR REPRODUCING IMAGES ON PROJECTOR SCREEN AND PHOTOSENSITIVE MEDIUM

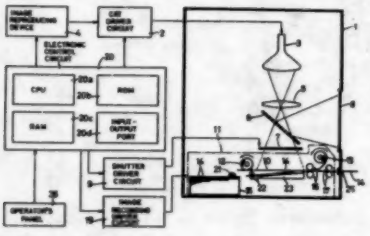
Kazuo Saagyoji; Takemi Yamamoto, both of Nagoya; Naoyuki Hatta, Gamagori; Kenji Sakakibara, Ichinomiya; Yuji Asano; Yoshimasa Hara, both of Nagoya; Yumio Matsumoto, Kasugai, and Kiyoharu Hayakawa, Aichi, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed May 18, 1988, Ser. No. 195,280

Claims priority, application Japan, May 21, 1987, 62-124154; May 21, 1987, 62-124155; May 29, 1987, 62-135376; Jun. 9, 1987, 62-88967[U]; Sep. 4, 1987, 62-222792; Sep. 17, 1987, 62-233236

Int. Cl.[5] G01D *15/16*; H04N *1/46*

U.S. Cl. 346—110 R 17 Claims



1. An irradiating device for producing a radiation to which a photosensitive recording medium is imagewise exposed to produce a color image on said recording medium, said recording medium bearing on a surface thereof at least two kinds of photosensitive components which are sensitive to said radiation and which produce respective colors with a density which varies with an intensity of said radiation, comprising:

signal converting means for converting an original intensity signal representative of a density of each of colors of an original image which correspond to said respective colors produced by said respective at least two kinds of photosensitive components of said photosensitive recording medium, into a modified intensity signal corresponding to a desired density of a corresponding one of said respective colors produced on said photosensitive recording medium due to exposure of said medium to said radiation, according to a relationship between an intensity of said radiation and a density of each of said respective colors produced by said at least two kinds of photosensitive components on said medium due to exposure of said medium to said radiation; and

optical image forming means for forming optical images corresponding to said at least two kinds of photosensitive components, according to said modified intensity signal.

4,965,593

PRINT QUALITY OF DOT PRINTERS

Mark S. Hickman, Escondido, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 27, 1989, Ser. No. 385,642

Int. Cl.[5] G01D *15/18*

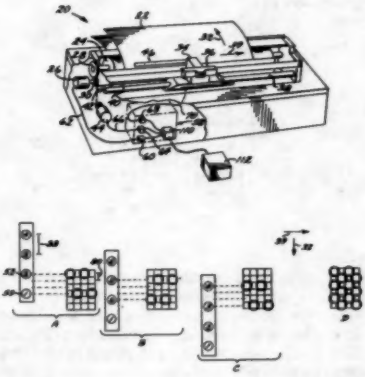
U.S. Cl. 346—140 R 9 Claims

1. A dot printer with the capability to print dots in a pixel array on a printing medium, said pixel array having a first fixed spacing in an advance direction and a second fixed spacing in a traverse direction, comprising:

a printhead having at least two pixel dot sources, the spacing between adjacent pixel dot sources in the direction parallel to the advance direction being equal to the first fixed pixel spacing times a first multiple that is an integer greater than one;

advance control means for moving the printing medium relative to the printhead in the advance direction by the first fixed spacing times a second multiple that is an integer greater than one and selected such that the ratio of the first multiple to the second multiple is an irreducible fraction;

traverse control means for moving the printhead relative to the printing medium in the traverse direction, and



a printing controller that directs the pixel dot sources to operate at pixel row locations that are displaced in the traverse direction from those in the adjacent row by the second fixed spacing times a third multiple that is an integer greater than one.

4,965,594

LIQUID JET RECORDING HEAD WITH LAMINATED HEAT RESISTIVE LAYERS ON A SUPPORT MEMBER

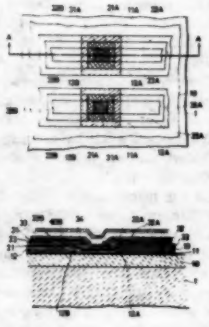
Hirokazu Komuro, Hiratsuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 19,125, Feb. 26, 1987, abandoned. This application Aug. 5, 1988, Ser. No. 230,703

Claims priority, application Japan, Feb. 28, 1986, 61-44844; Nov. 7, 1986, 61-264006

Int. Cl.[5] B41J *2/05, 2/205*

U.S. Cl. 346—140 R 24 Claims



1. An ink jet head comprising:

ink discharge ports for discharging ink therethrough;

an ink path communicating with said discharge ports;

a plurality of separate plural-layer laminates each presenting separate heat acting surfaces, each of said plural-layer

laminates comprising a plurality of heat resistive layers, and each of said heat resistive layers being a layer of one of said laminates and being disposed one atop another; and

a plurality of electrodes separately connected to each of said heat resistive layers of each said plural-layer laminate so as to enable each of said heat resistive layers to be heated individually, wherein

each of said heat resistive layer generates thermal energy to discharge ink through said discharge ports.

4,965,595

PRINTING HEAD OF COLOR INK JET PRINTER

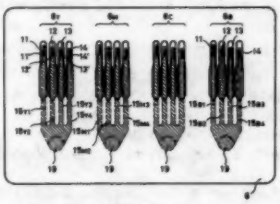
Hisashi Yoshimura, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 11, 1986, Ser. No. 850,625

Claims priority, application Japan, Apr. 15, 1985, 60-80484

Int. Cl.[5] B41J *2/045, 2/21, 2/175*

U.S. Cl. 346—140 R **3 Claims**



1. A printing head for an ink-jet printer which causes said printing head to sequentially execute a printing operation by activating reciprocating movement in the direction crossing the printing paper comprising;

a plurality of orifices which correspond to specific ink colors provided for said printer, said orifices corresponding to respective colors are further incorporated into a plurality of orifice groups, a separate common ink supply corresponding to each of said respective ink colors is provided for each of said orifice groups, an ink pool is positioned in front of each of said orifices, each of said orifices is connected to a separate pressure chamber via a passage, and a separate ink path independent of said passage extends from each said ink pool to said common ink supply having the proper respective ink color.

4,965,596

INK JET RECORDING APPARATUS WITH WASTE INK DISTRIBUTION PATHS TO PLURAL CARTRIDGES

Shigeyasu Nagoshi, Tokyo; Koji Terasawa, Mitaka, and Hideki Yamaguchi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 8, 1989, Ser. No. 307,505

Claims priority, application Japan, Feb. 9, 1988, 63-026503; Apr. 26, 1988, 63-103597

Int. Cl.[5] G01D *15/18*

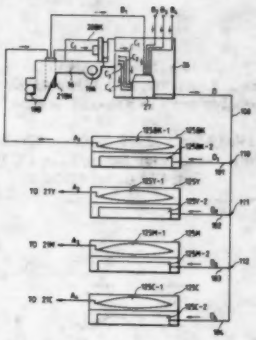
U.S. Cl. 346—140 R **15 Claims**

1. An ink jet recording apparatus comprising:

a plurality of ink cartridges containing inks of different colors;

a plurality of recording heads, receiving ink from said cartridges and discharging an ink droplet from corresponding nozzles; and

waste ink collecting means for collecting the waste ink exhausted from the nozzles in waste ink reservoirs of said plurality of ink cartridges, wherein said waste ink collecting means comprises an ink absorbent member provided in



a waste ink reservoir of each of said plurality of ink cartridges.

4,965,597

COLOR IMAGE RECORDING APPARATUS

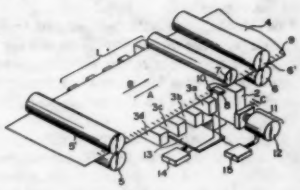
Chiaki Ohigashi, Yokohama; Shigeru Iemura, Kawasaki; Kazuhiro Shimamura, Tokyo, and Tetsuo Tanaka, Yokohama, all of Japan, assignors to Matsushita Graphic Communication Systems, Inc., Tokyo, Japan

Filed Aug. 11, 1987, Ser. No. 83,828

Claims priority, application Japan, Aug. 21, 1986, 61-196174

Int. Cl.[5] G03G *15/01;* **G01D** *15/06*

U.S. Cl. 346—157 **18 Claims**



1. In a color image recording apparatus for superimposing a plurality of images of different colors one on another to form a composite color image on a recording medium, said color image recording apparatus comprising:

latent image formation means provided in a path of transport of said recording medium;

energization means for energizing said latent image formation means to form a latent image on said recording medium;

a plurality of developing means supplied with different colors of developing agents for turning a latent image formed on said recording medium by said latent image formation means into a visual image;

transport means for transporting said recording medium back and forth;

timing control means for controlling said energization means at the time a latent image is formed on said recording medium by said latent image formation means;

edge sensor means for sensing one edge or both edges of said recording medium while said recording medium is transported, said edge sensor means including a light source for illuminating said recording medium and a line image sensor;

alignment means for controlling the position of a latent image formed by said latent image formation means on

said recording medium according to result of sensing by said edge sensor meand; and

sensor means for sensing state of transport of said recording medium.

4,965,598

PRINTING APPARATUS

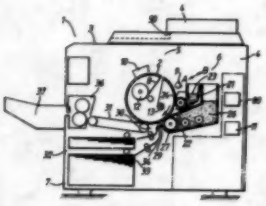
Toshihiro Kasai, Kanagawa, and Mitsuaki Kouyama, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 8, 1989, Ser. No. 320,443

Claims priority, application Japan, Mar. 17, 1988, 63-64066

Int. Cl.[5] G01D *15/00*

U.S. Cl. 346—160.1 **6 Claims**



1. A printing apparatus for producing multiple copies of an original image on a recording medium comprising:

a drum;

a master provided on the drum, the master formed of a thermosensitive adhesive material;

means for rotating the drum;

means for selectively heating on the master, while being rotated by the rotating means, an image corresponding to the original image so as to form an adhesive pattern of the image on the master;

means for developing the adhesive pattern image on the master the developing means having means for supplying a first magnetic developer to the adhesive pattern image on the master and means for permanently magnetizing the first magnetic developer on the master so as to form the master image;

means for applying a second developer image, corresponding to the original image, to the developed master image rotated by the rotating means, the applying means having means for adding a second magnetic developer to the master image; and

means for transferring substantially only the second developer image to the recording medium.

4,965,599

SCANNING APPARATUS FOR HALFTONE IMAGE SCREEN WRITING

James E. Roddy; Badhri Narayan, and Edward M. Granger, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

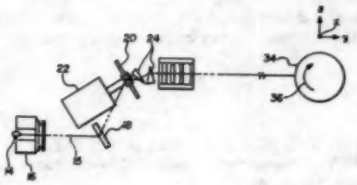
Filed Nov. 13, 1989, Ser. No. 435,651

Int. Cl.[5] G01G *15/00*; H04N *1/22*

U.S. Cl. 346—160 **5 Claims**

1. Improved scanning apparatus comprised of a pixel-writing line scan device having a plurality of line scanning elements adapted to produce a raster scanned halftone dot image screen in which each dot area is comprised of a plurality of pixel areas equal to the number of scan lines per dot in the cross scan direction times the number of intensity modulation pixels generated in the line scan direction, the halftone screen having, in the cross-scan direction, (i) a predetermined dot screen spatial frequency and (ii) a scan line spatial frequency equal to the number of scan lines per dot times the screen spatial frequency, the apparatus further having a once around scanner frequency equal to the ratio of the scan line frequency divided by the number of line scanning elements in the writing device, the improvement comprising:

the number of line scanning elements being that number that makes either the once around scanner frequency or the screen frequency an integral multiple of the other and



makes beat frequencies between the scanner frequency and screen frequency either fall outside spatial frequency spectrum visible to the human eye or be equal to the screen frequency thereby rendering cross-scan moiré banding in the image substantially imperceptible to the human eye.

4,965,600

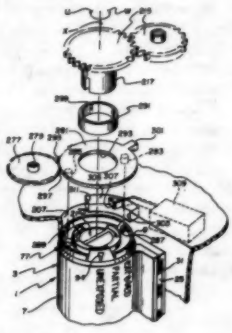
CAMERA FOR USE WITH FILM CASSETTE HAVING FILM-EXPOSURE STATUS INDICATOR

David C. Smart, Rochester, and Dennis E. Baxter, East Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 8, 1989, Ser. No. 390,931

Int. Cl.[5] G03B *1/00*

U.S. Cl. 354—212 **8 Claims**



1. A photographic camera intended to be used with a film cassette including a film-exposure status indicator movable from an unexposed position for providing a visible indication that a filmstrip within the cassette is generally unexposed, to a partly exposed position for providing a visible indication that the filmstrip is partly exposed, and to an exposed position for providing a visible indication that the filmstrip is partly exposed, wherein said camera comprises apparatus means for returning a filmstrip to a film cassette prematurely when the filmstrip is partly exposed and for advancing the filmstrip from the cassette subsequently to complete its exposure, and is characterized by including:

drive means, operable in engagement with the status indicator of a film cassette, for moving the status indicator from its unexposed position to its partly exposed position and to its exposed position; and

control means, integrated with said apparatus means and coupled with said drive means, for operating said drive

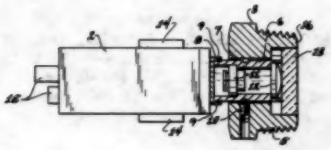
means to move the status indicator from its unexposed position to its partly exposed position in the event the filmstrip is partly exposed and to move the status indicator from either its unexposed position or its partly exposed position to its exposed position in the event the filmstrip is substantially exposed.

4,965,601

HIGH PRESSURE/TEMPERATURE CAMERA

Thomas M. Canty, 483 Fruitwood Terrace, Williamsville, N.Y. 14221

Filed Oct. 3, 1989, Ser. No. 416,706
Int. Cl.[5] G03B *37/00*
U.S. Cl. 354—63 **15 Claims**



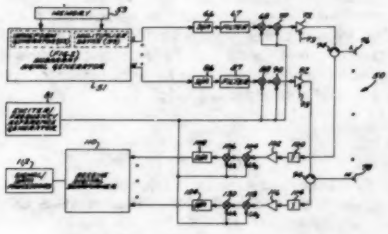
1. A camera viewing unit for viewing the interior of a vessel, comprising in combination a camera, a fixed lens housing, and a vessel attachment means, said fixed lens housing having rotatable connecting means to connect said lens housing to said camera and having means to connect said lens housing to said vessel attachment means, said fixed lens housing comprising a tubular configuration with a back and a front end portion and having at its front portion a fixed lens in visual alignment with a lens of said camera, said rotatable connecting means adapted to move said fixed lens and said fixed lens housing forward and backward to focus thereby, said vessel attachment means having at a forwardmost face a fused lens, said fused lens positioned to have direct contact with an interior of said vessel after said viewing unit is connected thereto.

4,965,602

DIGITAL BEAMFORMING FOR MULTIPLE INDEPENDENT TRANSMIT BEAMS

Peter J. Kahrilas, Placentia; Thomas W. Miller, Yorba Linda, both of Calif., and Samuel P. Lazzara, Genese, Belgium, assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 17, 1989, Ser. No. 422,934
Int. Cl.[5] H01Q *3/22, 3/24, 3/26*
U.S. Cl. 342—372 **12 Claims**



1. In a phased array system having an antenna aperture divided into a plurality of subarrays, a method of digital beamforming of multiple independent transmit beams, comprising a sequence of the following steps:

(i) generating in-phase (I) and quadrature (Q) sequential digital samples of a desired signal wave-form to be transmitted;

(ii) for each transmit beam to be formed, providing a different set of beamsteering phasors in digital form, each phasor representing the amplitude and phase distribution for the desired beam position and sidelobe distribution;

(iii) applying the respective sets of beamsteering phasors in digital form to said in-phase and quadrature signal components to provide resulting I and Q coefficients in digital form for each subarray;

(iv) upconverting the digital I and Q coefficients for each subarraay to an intermediate frequency (IF);

(v) converting the IF digital I and Q coefficients for each subarray into analog form;

(vi) upconverting the analog IF I and Q coefficients for each subarray to the desired RF transmit frequency;

(vii) amplifying the RF signals for each subarray; and

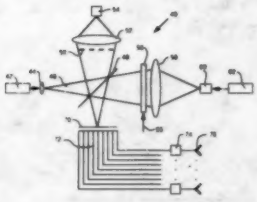
(viii) feeding the corresponding RF signals to the appropriate subarrays for transmission out of the array.

4,965,603

OPTICAL BEAMFORMING NETWORK FOR CONTROLLING AN RF PHASED ARRAY

John H. Hong, Moorpark, and Ian C. McMichael, Port Hueneme, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 1, 1989, Ser. No. 388,789
Int. Cl.[5] H01Q *3/22*; G01B *9/02*; G02B *1/12*
U.S. Cl. 342—372 **6 Claims**



1. An optical beamforming network for controlling a phased array antenna, comprising:

means for providing a first beam of coherent light;

means for providing a reference beam of coherent light;

means for distributing said reference beam;

means for spatially modulating said first beam, said spatially modulated beam carrying a footprint of a desired antenna radiation pattern;

means for providing a Fourier transform of said spatially modulated beam;

means for generating a frequency shifted phase conjugate return of said modulated and transformed beam;

means for combining said frequency shifted phase conjugate return with said distributed reference beam to generate a distributed beat frequency; and

means for receiving and detecting said distributed beat frequency to control the phased array antenna.

4,965,604

HIGH-POWER HIGH-ISOLATION SWITCH

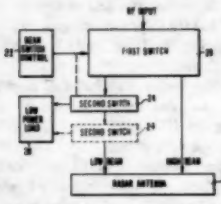
John W. Taylor, Jr., Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 2, 1988, Ser. No. 266,429
Int. Cl.[5] H01Q *3/02*
U.S. Cl. 342—374 **22 Claims**

1. A high-power high-isolation switch for switching radio frequency (RF) power between two or more outputs, comprising:

first switching means, including:

phase-shifting means for switching the bulk of the RF power to a desired output; and



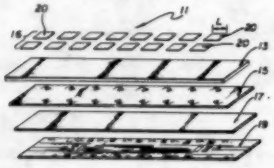
second switching means, coupled to said first switching means, for attenuating undesired power to the other outputs.

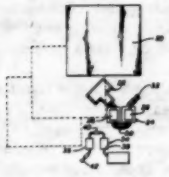
4,965,605

LIGHTWEIGHT, LOW PROFILE PHASED ARRAY ANTENNA WITH ELECTROMAGNETICALLY COUPLED INTEGRATED SUBARRAYS

Donald C. Chang, Thousand Oaks; Mon N. Wong, Torrance; Robert J. Patin, Hawthorne, and Stanley S. Chang, Palos Verdes Estates, all of Calif., assignors to HAC, Los Angeles, Calif.

Filed May 16, 1989, Ser. No. 352,787
Int. Cl.[5] H01Q *13/080, 1/320*
U.S. Cl. 343—700 MS **15 Claims**





1. An antenna, including:

a first layer of dielectric material having first and second opposite planar surfaces, said first layer of dielectric material including one or more patches of electrically conductive material provided on said first planar surface thereof;

a second layer of dielectric material having first and second opposite planar surfaces;

a first ground plane layer interposed between said first and second layers of dielectric material, said first ground plane layer having first and second opposite planar surfaces disposed in abutting relation with said second planar surface of said first layer of dielectric material and said first planar surface of said second layer of dielectric material, respectively, said first ground plane layer including one or more co-planar waveguide resonators provided on said first planar surface thereof, wherein said patches and said resonators are disposed in electromagnetically coupled relation to each other;

a second ground plane layer having first and second opposite planar surfaces, said first planar surface of said second ground plane layer being disposed in abutting relation with said second planar surface of said second layer of dielectric material, said second ground plane layer including signal handling circuitry provided on said first planar surface thereof, wherein said resonators and said signal handling circuitry are disposed in electromagnetically coupled relation to each other; and,

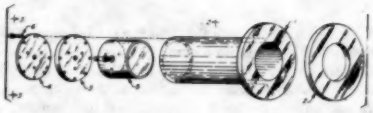
wherein said first dielectric layer has a relatively low dielectric constant and said second dielectric layer has a relatively high dielectric constant, and the above-cited layers are arranged in a stacked configuration.

4,965,606

ANTENNA SHROUD TEMPEST ARMOR

Miles A. Merkel, 2240 Golf Links Rd., Sierra Vista, Ariz. 85635

Continuation-in-part of Ser. No. 66,040, Jun. 24, 1987, abandoned. This application Apr. 14, 1989, Ser. No. 311,833
Int. Cl.[5] G01R *3/00*
U.S. Cl. 343—703 **3 Claims**



1. A device for containing and shielding radiated electromagnetic energy, specifically, an antenna shroud tempest armour device which provides stable and repeatable transfer and delivery of precisely quantified attenuation and phase characteristics of, precisely calibrated electromagnetic containment of, and protection from electromagnetic contamination of, radiated electromagnetic energy on test paths between electromagnetic energy radiators, flush mounted electromagnetic energy receiving antennas, comprising: a metal barrel, flanged on one end and with a flanged-end electromagnetic interference gasket, and drilled and tapped on the other end; said drilled and tapped end accomodating threaded fasteners; said fasteners holding an assembly consisting of an electromagnetic energy radiating feed, a threaded-fastener-end electromagnetic interference gasket and a metal end plate; said flanged end being pressed against said flanged-end electromagnetic gasket which is in turn pressed against usually flush mounted electromagnetic energy receiving antenna under test; pressure, of said flanged end against said flanged-end electromagnetic interference gasket and thence against said usually flush mounted electromagnetic energy receiving antenna under test, being supplied by an attached nonconducting strap which encircles the said electromagnetic energy receiving antenna being tested; said non-conducting strap having a device for applying tension in said nonconducting strap.

4,965,607

ANTENNA COUPLER

Mark L. Wilkins, and Alvin O. Wong, both of San Jose, Calif., assignors to BR Communications, Inc., Sunnyvale, Calif.

Filed Apr. 30, 1987, Ser. No. 44,960
Int. Cl.[5] H04B *1/02*
U.S. Cl. 343—861 **12 Claims**

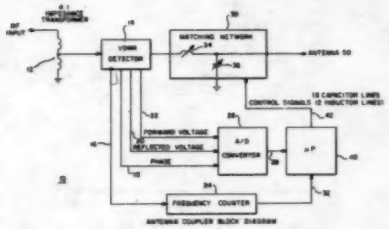
1. An antenna coupler comprising:

adjustable impedance matching network means for matching the output impedance of a transmitter at a radio frequency (RF) input to the input impedance of a non-broadband antenna,

means for tracking a swept, transmitted signal at said RF input, and

processor means responsive to the tracked signal for automatically adjusting said impedance matching network means to provide an impedance match between said output impedance and said input impedance wherein said processor means includes means for dividing the swept frequency range into discrete bands,

means for determining the frequency of said input signal to be matched for each of said bands, and for determining any changes in the frequency of said input signal,



means for measuring and quantifying the value of the impedance itself at said antenna for each of the determined frequencies,

means for calculating the amount of adjustment needed to match said output impedances and said input impedances based upon measured value of impedance for each of said determined frequencies, so as to provide an impedance match for each of said discrete bands.

4,965,608

DRIVING METHOD FOR INK JET HEAD

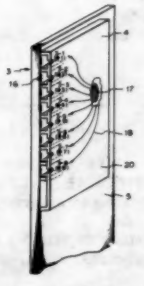
Hayato Shinohara, Yokohama, and Isao Tsukada, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1988, Ser. No. 190,170

Claims priority, application Japan, May 11, 1987, 62-115255

Int. Cl.[5] B41J *2/05*

U.S. Cl. 346—1.1 **15 Claims**



1. A driving method for driving an ink jet recording head to eject non-recording liquid for resolving or preventing clogging of, or defective liquid emission from, discharging nozzles, the method comprising the steps of:

providing an ink jet recording head having a plurality of discharging nozzles arranged in a vertical array and a plurality of heat generating members for ejecting liquid from corresponding said nozzles upon energization of said heat generating members by energizing circuitry, said recording head being mounted to a recording apparatus with said nozzles arranged in an array having a top portion and a bottom portion to emit liquid for recording;

determining if a pre-energization process should be initiated to eject non-recording liquid; and

initiating, if so determined, the pre-energization process by energizing said heat generating members in a sequence to eject non-recording liquid from said nozzles, wherein a heat generating member corresponding to one discharge nozzle in the array is initially energized before a heat generating member corresponding to another discharge nozzle disposed in the array beneath said one discharge nozzle is initially energized.

4,965,609

JET RECORDING METHOD USING INK WITH VISCOSITY OF AT LEAST 2CP WHICH IS HEATED TO LOWER THE VISCOSITY THEREOF TO BELOW 2CP BEFORE JETTING

Yasuko Tomida, Atsugi, and Shoji Koike, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 273,728, Nov. 18, 1988, abandoned, which is a continuation of Ser. No. 63,394, Jun. 18, 1987, abandoned. This application May 15, 1989, Ser. No. 352,628

Claims priority, application Japan, Jun. 20, 1986, 61-145617

Int. Cl.[5] B41J *2/05*

U.S. Cl. 346—1.1 **23 Claims**

1. An ink jet recording method which performs recording by attaching liquid droplets of a recording liquid onto a recording medium, comprising the steps of:

providing an ink jet recording device having a liquid flow path leading to ejection means;

selecting as said recording liquid a recording liquid having a viscosity of 2 centipoise or higher and a surface tension of 40 dyne/cm or higher, each being measured at 25° C., and said recording liquid containing 50 wt. % or more water and at least one water-soluble organic solvent selected from the group consisting of glycerin, diethylene glycol, triethylene glycol, triethylene glycol monomethyl ether, triethylene glycol monoethyl ether and polyethylene glycol;

heating said recording liquid so as to reduce the viscosity thereof to below 2 centipoise; and

thereafter introducing the heated recording liquid having a viscosity of less than 2 centipoise into said liquid flow path upstream of said ejection means.

4,965,610

INK-JET RECORDING METHOD

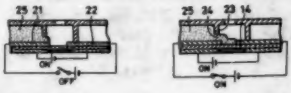
Takatoshi Ishikawa, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

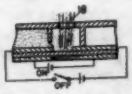
Filed Aug. 28, 1989, Ser. No. 399,655

Claims priority, application Japan, Aug. 29, 1988, 63-214638

Int. Cl.[5] G01D *15/16*; B41J *3/04*

U.S. Cl. 346—1.1 **1 Claim**





1. An ink-jet recording method comprising:

maintaining a heat emitting body at a temperature higher than the ink vaporizing temperature; and

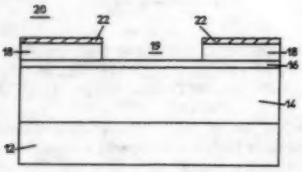
transporting the ink onto the heat emitting body only at the time of printing.

4,965,611

AMORPHOUS DIFFUSION BARRIER FOR THERMAL INK JET PRINT HEADS

Alfred I. Pan, Sunnyvale, and Eric G. Hanson, Burlingame, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 22, 1989, Ser. No. 327,878
Int. Cl.[5] B41J 2/05
U.S. Cl. 346—1.1 7 Claims



7. A corrosion-resistant integrated ink jet print head for expelling an ink droplet from a heated region, the head comprising:

a. a silicon substrate;

b. an insulative silicon dioxide layer formed over the substrate;

c. an unpassivated resistive heating layer deposited over the insulative layer, the resistive heating layer being formed from tantalum aluminum alloy;

d. a conductive layer including at least a pair of discrete gold layers, the gold layers being deposited over the resistive heating layer, each pair of discrete gold layers together with the resistive heating layer defining the heated region; and

e. a top layer of corrosion-resistant amorphous metallic alloy, applied over the conductive layer but not applied over the resistive heating layer, which serves as a diffusion barrier that inhibits the diffusion of the ink droplet into the gold layers, thus avoiding corrosion of the gold layers by the ink.

4,965,612

INK-JET RECORDING SYSTEM AND INK-JET RECORDING METHOD

Mamoru Sakaki, Sagamihara; Tomomi Nakatsugawa, Kawasaki; Shoji Koike, and Hiroshi Sato, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1989, Ser. No. 429,603
Claims priority, application Japan, Nov. 2, 1988, 63-277638; Nov. 2, 1988, 63-277639; Oct. 16, 1989, 1-269573
Int. Cl.[5] B41J 2/21
U.S. Cl. 346—1.1 22 Claims

1. An ink-jet recording system comprising applying droplets of water-based inks of a yellow ink, a magenta ink, a cyan ink and a black ink onto a recording medium comprising a substrate paper having a surface layer comprising a pigment and a fibrous substance of the substrate paper which are present in a mixed state, and said recording medium having a Stöckigt sizing degree ranging from 0 to 15 seconds, to carry out recording, wherein:

at least an ink with a dye concentration ranging from 2.5 to 4.5% by weight is used as said black ink; and

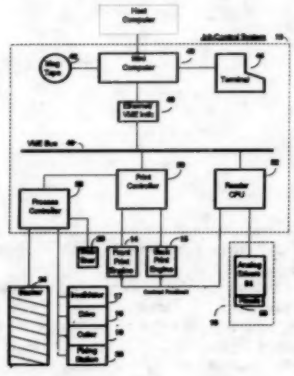
the recording is carried out in a maximum ink-adhering quantity ranging from 14 nl/mm^2 to 20 nl/mm^2 and in a maximum print-overlap number ranging from 2 to 2.5.

4,965,613

PAGE PRINTER WITH MACHINE-READABLE-CHARACTER-BASED CONTROLS

Scott S. Morris, Oklahoma City, Okla.; James F. Shramek, Burlington, Mass., and David P. Owsley, Edmond, Okla., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Dec. 12, 1989, Ser. No. 449,641
Int. Cl.[5] G03G 21/00
U.S. Cl. 346—25 15 Claims



1. In combination in a data printer having paper feeding means for feeding paper along a paper path from an outstream paper supply to an instream paper stacker and at least one print engine located on the paper path and responsive to externally-supplied digital signals for imprinting on the paper alphanumeric information specified by the digital signals:

a job control processor comprising digital computer means for a controlling elements of the printer;

means in the print engines responsive to the digital signals or the job control processor for imprinting machine-readable characters on the paper; and

means instream from the print engines for reading machine-readable characters and for sending digital representations of the characters to the job control processor.

4,965,614

RECORDER WITH DUAL MADE OPERATION

Kiminori Ishizuka, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

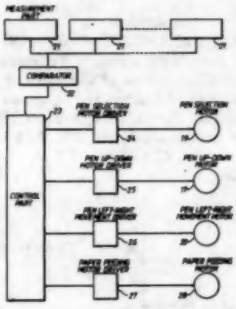
Filed Mar. 10, 1989, Ser. No. 322,451
Claims priority, application Japan, Apr. 22, 1988, 63-54326[U]
Int. Cl.[5] G01D 9/00, 15/16
U.S. Cl. 346—34 5 Claims

1. A recorder for recording a plurality of measurement quantities on a recording medium comprising:

comparator means for comparing the plurality of measurement quantities with respective predetermined setpoints, said comparator means including selection means for automatically selecting one of the plurality of measurement quantities when said one of the measurement quantities exceeds said respective predetermined setpoint; and

recorder means for recording the plurality of measurement quantities, having a first mode of operation wherein the plurality of measurement quantities are recorded discon-

tinuously on the recording medium in a given order, and a second mode of operation wherein said one of the mea-



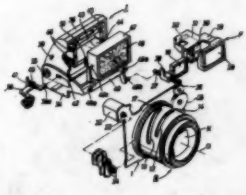
surement quantities selected by said selection means is recorded continuously on the recording medium.

4,965,615

VARIABLE FOCUS CAMERA

Masami Fujita; Kazuhiro Nakanishi, and Yoshinobu Sameshima, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Oct. 4, 1988, Ser. No. 253,180
Claims priority, application Japan, Oct. 9, 1987, 62-255642; Oct. 9, 1987, 62-255643
Int. Cl.[5] G03B 13/12, 15/05
U.S. Cl. 354—145.1 11 Claims



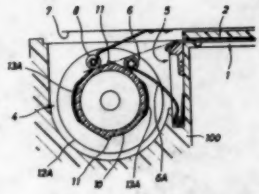
1. A variable focus camera comprising: a photographing lens including at least two components, a finder including means for changing a position of a magnification adjusting lens of the finder in response to rotation of a cam barrel of said photographing lens, said cam barrel including at least two magnification correction cams for extending the components of said photographing lens and having a focal-point correction function, a magnification of said photographing lens is caused to coincide with a magnification of said finder by said magnification correction cams, a driven member for converting rotation of said cam barrel into linear movement to move said magnification adjusting lens of said finder, and wherein said magnification correction cams are formed so that said driven member is linearly displaced upon rotation of said cam barrel.

4,965,616

AUTOMATIC LOADING CAMERA WITH CLAW SPOOL

Tohru Horiuchi, Tokyo, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Feb. 23, 1989, Ser. No. 313,836
Claims priority, application Japan, Feb. 26, 1988, 63-44755
Int. Cl.[5] G03B 1/04; G65H 75/29
U.S. Cl. 354—212 4 Claims



1. A spool driven, claw winding automatic loading camera, comprising:

a film winding spool disposed in the camera for rotation about an axis, the spool including an outer circumferential surface and opposed axial ends;

at least one claw portion projecting from the outer circumferential surface of the spool and being disposed to engage perforations in a leader portion of a film roll; and

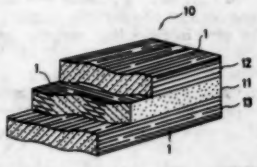
at least one step portion projecting from the outer circumferential surface of the spool and being axially positioned between the at least one claw portion and one of the opposed ends.

4,965,617

PLATE FOR LIGHT SHIELDING BLADE

Takashi Matsubara, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jun. 13, 1989, Ser. No. 365,301
Claims priority, application Japan, Jun. 17, 1988, 63-148263
Int. Cl.[5] G03B 9/40
U.S. Cl. 354—246 14 Claims

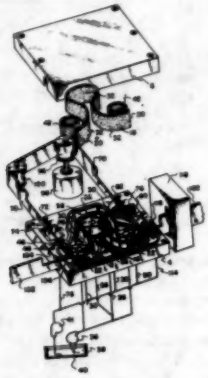


1. A thin plate having a thickness of 60 to 120 μm and comprising a laminate of at least three carbon fiber reinforced resin sheets each having continuous carbon fibers oriented in a predetermined direction and enveloped in a resin matrix, with a light-shielding intermediate one of said sheets containing black pigment in an amount of 5 to 15 wt. % and two outer ones of said sheets being substantially devoid of black pigment.

4,965,618
METHOD AND APPARATUS FOR TRANSPORTING AND LIQUID TREATING INDETERMINATE LENGTHS OF WEB MATERIAL

Mark J. Devaney, Jr., and Edward H. Wanneawetsch, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 2, 1989, Ser. No. 388,458
Int. Cl.[5] G03D *5/00*
U.S. Cl. 354—317 28 Claims



1. An apparatus for transporting an elongated web over a porous, liquid pervious surface, comprising:

a housing defining an interior plenum having upper and lower walls and a peripheral wall extending therebetween;

at least one serpentine stationary wall means extending substantially vertically between said upper and lower walls for dividing said interior plenum to define liquid inlet and outlet plenums, said serpentine wall means defining a plurality of oppositely opening loops, said loops opening alternately into said liquid inlet and outlet plenums, said serpentine wall means being made from a porous, liquid pervious material between said inlet and outlet plenums;

means for pumping liquid into said inlet plenum to pass through said porous material of said serpentine wall means and into said outlet plenum;

hollow at least partial cylinder means located in those of said loops opening into said outlet plenum, said cylinder means each being made from said liquid pervious material and defining an interior volume connected to receive liquid from said pumping means and to pass said liquid through said material to said outlet plenum, said cylinder means being spaced from said serpentine wall means to define therebetween at least one partially annular passageway in said outlet plenum extending between said upper and lower walls;

means for withdrawing liquid from said outlet plenum;

an elongated transport web threaded on edge through said at least one partially annular passageway and along the surface of the adjacent one of said loops opening into said inlet plenum;

means for permitting insertion, between said transport web and said serpentine wall, of an elongated process web to be transported through said apparatus and treated by said liquid; and

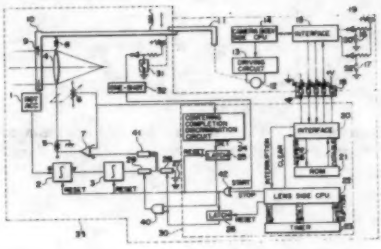
means for moving said transport web through said passageway and over said surface,

whereby a thin layer of liquid flowing through said serpentine wall means and said cylinder means supports said transport web and said process web in mutual contact but substantially out of contact with the surface of said serpentine wall means and said cylinder means, while said process web is treated by said liquid.

4,965,619
IMAGE STABILIZING DEVICE

Masao Shikaumi; Toru Nagata, both of Yokohama; Koichi Washisu, and Hiroshi Sumio, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1989, Ser. No. 299,077
Claims priority, application Japan, Jan. 20, 1988, 63-10043
Int. Cl.[5] G03B *7/00*
U.S. Cl. 354—410 22 Claims



1. An image stabilizing device capable of being mounted on a camera having an optical system, comprising:

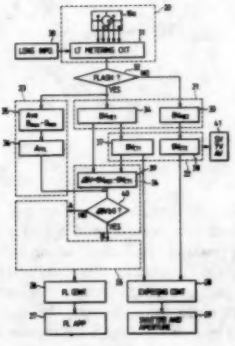
(a) image stabilizing means for preventing image blur; and

(b) control means for controlling said image stabilizing means by automatically responding to the operation of said camera performed independent of the operation of said image stabilizing means.

4,965,620
CAMERA

Tadao Takagi, Yokohama; Toshihiro Sato, Tokyo, and Takashi Saegusa, Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed May 10, 1989, Ser. No. 349,846
Claims priority, application Japan, May 13, 1988, 63-116723
Int. Cl.[5] G03B *15/05*
U.S. Cl. 354—416 11 Claims



1. A camera comprising:

(a) light metering means;

(b) appropriate luminance calculating means for calculating an appropriate luminance on the basis of the output of said light metering means and producing an appropriate luminance signal;

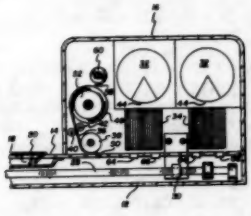
(c) exposure control means;
(d) control luminance calculating means for calculating a control luminance corresponding to an exposure value controlled by said exposure control means;
(e) discrimination means for comparing said appropriate luminance with said control luminance;
(f) flash light emission means for emitting flash light toward an object;
(g) determination means for determining a control level on the basis of the output of said light metering means;
(h) correction means for correcting said control level on the basis of the result of comparison by said discrimination means; and
(i) flash light control means for controlling the termination of the flash emission from said flash light emission means on the basis of said corrected control level and at least a part of light from said object.

4,965,621

COMPACT LIGHT COLLIMATOR FOR A SCANNING CONTACT PRINTER

Robert S. Jones, and John J. Maurer, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 17, 1989, Ser. No. 440,577
Int. Cl.[5] G03B *27/00, 27/10;* G02B *6/00*
U.S. Cl. 355—1 **16 Claims**



1. In a contact printer comprising means for supporting a film and an original in superposed relationship, means for providing a source of light for exposing said film through said original, and means for moving said light over the surface of said superposed film and original, the improvement comprising means carried by said light moving means for collimating said light, said light collimating means comprising a plurality of parallel tubular members having a length to diameter ratio greater than about four and extending between said light source and said film.

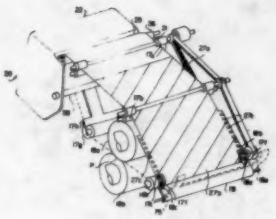
4,965,622

IMAGE FORMING APPARATUS

Yoshiaki Ibuchi, Nari, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 8, 1989, Ser. No. 391,287
Claims priority, application Japan, Aug. 8, 1988, 63-197637; Sep. 5, 1988, 63-221546; Sep. 29, 1988, 63-127793[U]
Int. Cl.[5] G03B *27/32*
U.S. Cl. 355—27 **9 Claims**

1. An image forming apparatus in which a photosensitive sheet coated with microcapsules containing photohardening materials and coloring dyes is exposed to light from the original image and then pressed, with an image receiving sheet coated with developer, between a pair of pressure rollers, resulting in an image on said image forming sheet, comprising:
a photosensitive sheet cartridge in which said photosensitive sheet is accommodated in a rolled form, a leader sheet being connected to the leading edge of said photosensitive sheet and numerous positioning holes being provided at regular intervals on both sides of said leader sheet in the longitudinal direction of said photosensitive sheet, the body of said image forming apparatus onto which said photosensitive sheet cartridge is detachably mounted, and
a guide roller for transporting said photosensitive sheet, which is drawn from said photosensitive sheet cartridge,



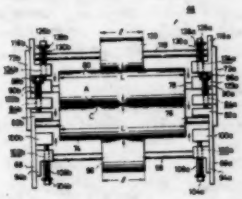
toward said pair of pressure rollers when said cartridge is installed into the body of said image forming apparatus, said guide being provided with guide protrusions, at regular intervals on the outer surface thereof, which engage with said positioning holes of said leader sheet.

4,965,623

IMAGE RECORDING APPARATUS AND METHOD

Nagao Ogiwara, and Akihiko Nagumo, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 151,125, Feb. 1, 1988, Pat. No. 4,827,312.
This application Jan. 3, 1989, Ser. No. 292,842
Claims priority, application Japan, Jan. 30, 1987, 62-19952; Feb. 6, 1987, 62-26800; Feb. 13, 1987, 62-31098; Feb. 13, 1987, 62-31100; Apr. 24, 1987, 62-100143; Nov. 10, 1987, 62-281993; Nov. 12, 1987, 62-286780
Int. Cl.[5] G03B *27/32, 27/52;* G03D *9/00;* G03C *1/72*
U.S. Cl. 355—27 **4 Claims**



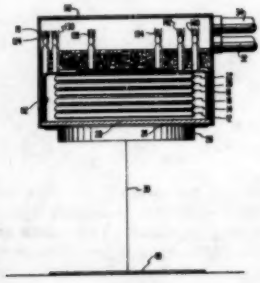
1. In an image recording method employing a photosensitive material formed by coating a support with a material which, when pressurized, fixes an image formed by optical exposure so that a visible image is obtained through pressurization, the improvement comprising:
simultaneously pressurizing and conveying said photosensitive material with a pair of spring biased pressurizing rollers in a direction perpendicular to a longitudinal direction of said pressurizing rollers by adjustably controlling elastic forces of said pressurizing rollers by adjustably controlling elastic forces of a plurality of springs for biasing said pressurizing rollers in such a manner that, while said photosensitive material passes through said pressurizing rollers, a pressure which increases gradually along said pressurizing rollers from both ends towards the middle thereof is applied to said photosensitive material.

4,965,624

COLD CATHODE LIGHT SOURCE FOR ADDITIVE COLOR ENLARGER

Odas E. Arant, 630 Jackson Ave., Lake Worth, Fla. 33463

Filed Jun. 24, 1988, Ser. No. 211,256
Int. Cl.[5] G03B 27/72
U.S. Cl. 355—35 **11 Claims**



1. A light source device for a color enlarger or printer which includes an enlarger head housing having a lower opening and an opposed head and means for directing light toward an area through the lower opening, comprising:

means for emitting red light toward said area, said red light emitting means comprising at least two cold cathode discharge tubes in the form of first and second red grids, said red grids being located substantially proximate to and horizontal with the lower opening in the enlarger head housing, each of said red grids being adjacent to the other red grid;

means for emitting blue light toward said area, said blue light emitting means comprising at least two blue light cold cathode discharge tubes in the form of first and second blue grids;

means for emitting green light towards said area, said green light emitting means comprising at least two green light cold cathode discharge tubes in the form of first and second green grids, said blue grids and said green grids being arranged horizontal to said lower opening in the housing, with the first green grid positioned adjacent the second red grid and the second green grid and the first and second blue grids being positioned in alternate horizontal relationship to each other;

a reflective grid housing; and

means for varying the intensity of the light emitted by each of the grids.

4,965,625

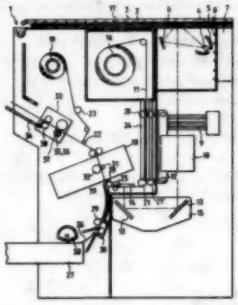
IMAGE FORMING APPARATUS HAVING IMAGE FORMING DATA INPUTTING DEVICE

Kenji Sakakibara, Ichinomiya; Masashi Ueda, Nagoya; Shigeki Ishikawa, Nagoya; Jun Sakai, Nagoya, and Takeshi Izaki, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 19, 1989, Ser. No. 452,385
Claims priority, application Japan, Dec. 21, 1988, 63-165920[U]; Jan. 30, 1989, 1-20408
Int. Cl.[5] G03B 27/72
U.S. Cl. 355—35 **20 Claims**

1. An image forming apparatus for inputting image forming data for an image to be copied and performing a series of copying processes on the basis of the image forming data to obtain a copied image, comprising:

image forming data inputting means comprising a first input unit for inputting a first data representing a color selected from a first color gradation and a second input unit for inputting a second data representing a color selected from a second color gradation, said first and second color gradations being defined between any two colors of primary three colors (red, green and blue) and between the other color and a complementary color thereof, respectively; and



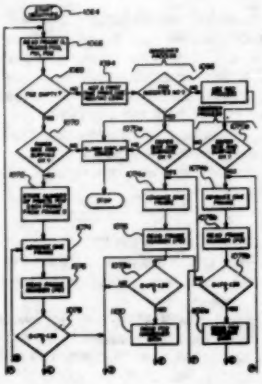
control means for receiving the first and second data and adjusting the color balance of the image to be copied on the basis of the first and second data to obtain the copied image having a desired color balance.

4,965,626

PRINTING AND MAKEOVER PROCESS FOR MAGNETICALLY ENCODABLE FILM WITH DEDICATED MAGNETIC TRACKS

Gary L. Robison, Rochester, and Michael L. Wash, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 7, 1988, Ser. No. 255,892
Int. Cl.[5] G03B 27/52, 17/24
U.S. Cl. 355—40 **3 Claims**



1. A method for developing and making prints from an elongate photographic film strip having successive frams, a virtually transparent magnetic layer and a plurality of longitudinal tracks magnetically recorded in said magnetic layer, each of said tracks being generally adjacent a corresponding one of said frames, different ones of said tracks containing magnetically recorded data relating to different data categories, said film strip having an initial frame wherein lies a makeover/-reorder instruction track allocated to the recording of make-over andre-order instruction data, subsequent frames of said film strip bearing exposed images, each of said subsequent

frames comprising one or more subsequent frame tracks dedicated to the recording of classification data and inspection data including makeover correction data for the respective subsequent frame, said method comprising:

if said instruction track in said initial frame is empty, determining the classification of each of said subsequent frames, recording said classification in a subsequent frame track of the respective subsequent frame and exposing and printing said frame in accordance with said classification;

if said instruction track in said initial frame is not empty, and if the data therein indicates makeover corrections for subsequent frames without re-order instruction data, determining from data in a subsequent frame track of those of said subsequent frames for which makeover corrections are required, the classification and makeover correction thereof, and making a print in accordance therewith; and

if said instruction track in said initial frame contains re-order instruction data, determining from data recorded in a subsequent frame track, the classification and makeover correction, if any of each exposed frame, and making a print in accordance therewith.

4,965,627

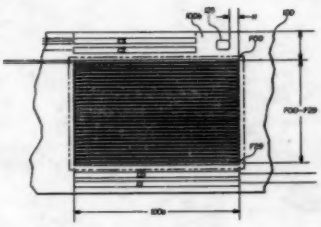
FILM INFORMATION EXCHANGE SYSTEM USING DEDICATED MAGNETIC TRACKS ON FILM WITH VIRTUAL DATA INDENTIFIERS

Gary L. Robison, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 254,982, Oct. 7, 1988, abandoned. This application Aug. 14, 1989, Ser. No. 394,248

Int. Cl.[5] G03B *17/24, 27/52;* G03C *1/76*

U.S. Cl. 355—40 **6 Claims**



1. In an elongate photographic film strip having successive frames, the improvement comprising:

a virtually transparent magnetic layer; and

plural longitudinal parallel magnetic tracks recorded in said magnetic layer, each of said tracks comprising plural fields, at least some of said fields comprising a solitary virtual identification code and a plurality of sub-fields comprising magnetically recorded data representative of different parameters.

4,965,628

PHOTOGRAPHIC FILM WITH LATENT IMAGE MULTI-FIELD BAR CODE AND EYE-READABLE SYMBOLS

Richard Olliver; Cortlandt E. Johnson, both of Rochester, and David L. Patton, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

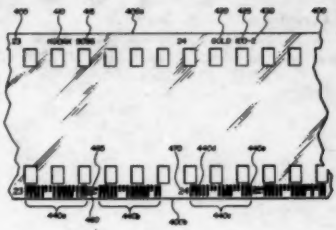
Filed Jan. 28, 1989, Ser. No. 372,973

Int. Cl.[5] G03B *27/52*

U.S. Cl. 355—41 **4 Claims**

1. In a strip of photographic film susceptible of photographically recording an ordered succession of image frames therein between opposing longitudinal edges thereof, the improvement comprising:

a succession of images recorded along one of said longitudinal edges, each of said images representing a bar code binary sequence comprising plural fields, said plural fields comprising a clock start pattern, a clock stop pattern and a first field comprising binary bits representing the type of



said film and a second field comprising binary bits representing a frame number, said first and second fields lying between said clock start pattern and said clock stop pattern.

4,965,629

SHEET FINISHER WITH A BINDER

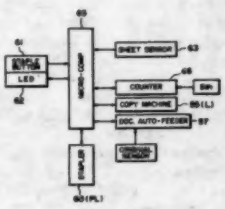
Masakazu Hiroi, Yokohama; Masataka Naito, Kawasaki, and Koichi Murakami, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1989, Ser. No. 322,401

Claims priority, application Japan, Mar. 14, 1988, 63-060063

Int. Cl.[5] G03B *27/48, 27/50;* G03G *21/00*

U.S. Cl. 355—50 **8 Claims**



1. A sheet sorter with a binder, comprising:

a plurality of bins for accommodating sorted sheets discharged after images are formed thereon;

means for shifting said plurality of bins each time the sheet is received by a said bin;

binder means for binding the sheets stacked on said bins in a binding mode;

counting means for counting a number of sheets accommodated in said bins;

automatic control means for controlling shifting operation of said bins and binding operation of said binding means in response to a signal indicative of completion of sheet accommodating operation when the binding mode is selected;

manual control means for controlling the shifting operation of said bins and binding operation of said binding means; and

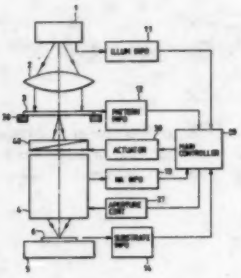
control means for discriminating whether or not the number counted by said counting means is within a predetermined range, and for permitting operation of said binder means by actuation of said manual control means, when the number is within the predetermined range.

4,965,630

PROJECTION EXPOSURE APPARATUS

Kinya Kato, Yokohama; Kazuo Ushida; Toshiyuki Namikawa, both of Tokyo; Koichi Matsumoto, Kita; Kyoichi Suwa, and Koichi Ohno, both of Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Dec. 15, 1989, Ser. No. 451,166
Claims priority, application Japan, Dec. 21, 1988, 63-320616
Int. Cl.[5] G03B 27/68
U.S. Cl. 355—52 8 Claims



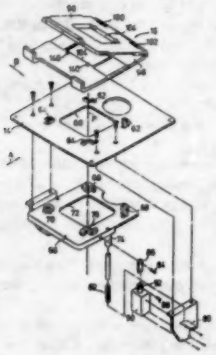
1. A projection exposure apparatus comprising:
a reticle stage;
an illumination optical system for illuminating a reticle on said reticle stage;
a stage on which a substrate is supported; and
a projection optical system having a predetermined numerical aperture to project a pattern formed on said reticle and illuminated by said illumination optical system onto said substrate, and in which a longitudinal spherical aberration thereof regarding the focusing of said pattern formed on said reticle onto said substrate is excessively corrected.

4,965,631

DEVICE FOR MOUNTING PHOTOGRAPHIC NEGATIVE CARRIER

Yoshio Ozawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 23, 1988, Ser. No. 288,884
Claims priority, application Japan, Jan. 28, 1988, 63-17674
Int. Cl.[5] G03B 27/62
U.S. Cl. 355—75 18 Claims



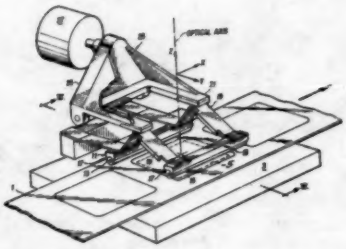
1. A device for mounting a negative carrier carrying a negative film into a photographic printer, said device comprising:
a base plate which is provided with an opening for printing and upon which the negative film is placed; and
engaging means disposed between the base plate and the negative carrier to permit the negative carrier to be moved into a printing position upon the base plate and toward the optical axis of printing from any one of plural different directions in such a way that the carrier can assume only a given posture, whereby the ends of the negative film protruding from the carrier are prevented from falling into the opening, said engaging means comprising locating protrusions protruding from the rear side of said negative carrier and locating protrusions protruding from said base plate, said base plate locating protrusions being operative to guide the carrier locating protrusions.

4,965,632

FILM CLAMP

Bradley S. Jadrich, and Edward H. Wakefield, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 28, 1989, Ser. No. 442,375
Int. Cl.[5] G03B 27/62, 27/64
U.S. Cl. 355—76 12 Claims



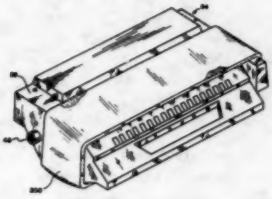
1. A film clamp comprises:
(a) a platen having:
(i) a flat working surface and
(ii) an aperture in said flat working surface, said aperture having a first side and a second side;
(b) a first gripping member sized, shaped, and positioned to extend along said first side of said aperture and to grip a film between said platen and said first gripping member;
(c) a second gripping member sized, shaped, and positioned to extend along said second side of said aperture and to grip the film between said platen and said second gripping member;
(d) first means for pressing said first gripping member at least generally perpendicularly toward said platen; and
(e) second means for pressing said second gripping member:
(i) toward said platen and away from said first gripping member and
(ii) after said first gripping member has gripped the film, whereby first one edge of the film is held in position by said first gripping member and then a second edge of the film is pushed down on said platen and away from said first gripping member.

4,965,633

ELECTROPHOTOGRAPHIC COPIER PROCESS KIT HAVING REMOVABLE CLOSURE MEMBERS

Tyrone N. Surti, 424 Harding Industrial Dr., Nashville, Tenn. 37211

Filed Aug. 18, 1988, Ser. No. 233,448
Int. Cl.[5] G03G 15/00
U.S. Cl. 355—200 10 Claims



1. A process kit for insertion and use in an image-forming apparatus comprising:

a housing;

a photosensitive drum rotatably mounted in said housing;

processing means including a plurality of components mounted in said housing in spaced relation around said photosensitive drum, said components including at least a corona discharge means for uniformly charging said photosensitive drum to a predetermined potential, development means for developing an electrostatic latent image formed on the photosentive drum, and a cleaning device for cleaning said photosensitive drum subsequent to formation of said electrostatic latent image thereon, said cleaning device being in peripheral spaced relation around said photosensitive drum from said development means;

said housing including a first optical opening located upstream of said corona discharge means for conducting a uniform light to said photosensitive drum to discharge remaining charge on said photosensitive drum, a second opening for exposure located between said corona discharge means and said development means for conducting said information light to said photosensitive drum, a third opening disposed at a position generally opposite said first and second openings, and guide means disposed adjacent to said first, second, and third openings; and

removable cover means removably carried by said housing, said removable cover means being a rigid unitary member having extending fingers disposed for slidable relation in said guide means for removably mounting said removable cover means over said first, second, and third openings for enclosing said first, second, and third openings prior to insertion of said process kit in said image forming apparatus, said removable cover means disposed for complete removal from said first, second, and third openings for unobstructed relation of said first, second, and third openings in said image forming apparatus subsequent to insertion of said process kit in said image forming apparatus.

4,965,634

IMAGE RECORDING APPARATUS CAPABLE OF CONTROLLING IMAGE DENSITY

Toshiro Bando, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 16, 1989, Ser. No. 437,515
Claims priority, application Japan, Nov. 18, 1988, 63-292200
Int. Cl.[5] G03G 15/08
U.S. Cl. 355—208 4 Claims

1. An image recording apparatus capable of controlling image density, comprising:

an image carrier;

charging means for charging said image carrier;

illuminating means for illuminating a document laid in an image reading area of a glass platen to electrostatically form a latent image representative of said document on said image carrier;

developing means for developing the latent image formed on said image carrier to produce a visible image;

a reference density pattern having a reference density positioned in close proximity to said image reading area;

read image density sensing means for sensing a density of said reference density pattern and a density of the document;

recorded image density sensing means located to face a surface of said image carrier for sensing an image density of a recorded image having been developed by said developing means; and

control means for automatically adjusting an amount of light issuing from said illuminating means in response to a first recorded image density which is sensed by said recorded

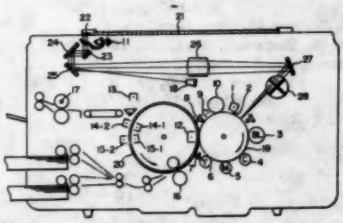


image density sensing means and associated with an image portion of said reference density pattern having a relatively low density;

said control means automatically adjusting a target value of a density of a developer stored in said developing means in response to a second recorded image density which is sensed by said recorded image density sensing means and associated with a portion of said reference density pattern having a relatively high density;

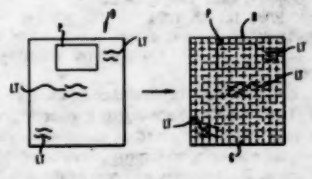
said control means automatically adjusting a bias voltage to be applied to said developing means in response to a ratio of a first read image density which is sensed by said read image density sensing means and associated with the density of said reference density pattern and a second read image density which is sensed by said read image density sensing means and associated with the density of the document.

4,965,635

DIGITIZER APPARATUS AND METHOD

Norman Rushefsky, Brighton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 13, 1989, Ser. No. 365,332
Int. Cl.[5] G03G 15/00
U.S. Cl. 355—218 13 Claims



1. In a method of reproducing documents employing a reproduction apparatus, having a function for selective area treatment, by digitizing a document to identify areas thereof

for selective treatment by said apparatus, said method comprising the steps of:

placing the original to be reproduced upon a support of said apparatus;

exposing the original to form a latent image thereof upon a recording element;

toning the image to develop the latent image into a visible copy image reproduction of the original;

transferring the copy image to a receiver sheet, and characterized by

forming a second toner image upon the receiver sheet in register with the copy image, the second toner image defining a pattern fc.r use in digitizing the copy image for selective area treatment.

4,965,636

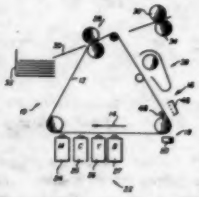
ELECTROSTATOGRAPHIC MACHINE WITH SCREENING

Allen J. Rushing, Webster; Donald J. Clar, Jr., N. Chili, and Walter B. Sherwood, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 15, 1989, Ser. No. 352,238

Int. Cl.[5] G03G *15/22, 15/32*

U.S. Cl. 355—239 **5 Claims**



1. In apparatus having a photoconductive member, charging means for applying an electrostatic charge to each region of the photoconductive member over a predetermined time period, and screening means for forming an electrostatic latent half-tone pattern image on the photoconductive member such that exposure of the photoconductive member to a light pattern of a continuous tone original document will form a half-tone latent image on the photoconductive member; the improvement wherein said screening means forms the half-tone pattern image during the predetermined time period that each region of the photoconductive member is being charged such that the half-tone pattern is partially charged over and filled in.

4,965,637

CONTROL DEVICE FOR AN IMAGE FORMING APPARATUS

Eiichi Katoh; Koichi Asakura; Yutaka Hasegawa, all of Tokyo, and Toshiro Bando, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 13, 1989, Ser. No. 379,366

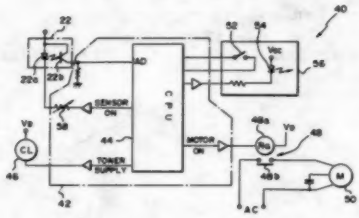
Claims priority, application Japan, Jul. 26, 1988, 63-184716

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—246 **4 Claims**

1. In a control device for an image forming apparatus for controlling toner supply by sensing by a toner sensor a density of a toner image which is formed on an image carrier which is driven by a drive system, an improvement comprising:

control means for detecting an error of the drive system in response to output data of the toner sensor, wherein said control means comprises reading output data of the toner sensor at predetermined intervals while comparing first and second individual output data which are read by said reading means and determining means for determining,



when the output data do not compare so as to be equal, that the drive system is operating normally.

4,965,638

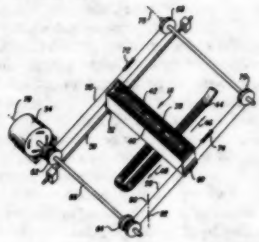
DRIVE ARRANGEMENT FOR MOVING A DOCUMENT SCANNER

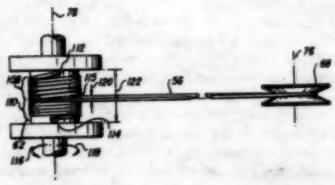
Edwin A. Hediger, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 2, 1989, Ser. No. 415,938

Int. Cl.[5] G03G *15/04*

U.S. Cl. 355—235 **16 Claims**





1. A document scanner suitable for scanning the image content of an original document, said scanner comprising:

a movable device;

means for guiding the direction of movement of said device;

at least one rotatable drive member;

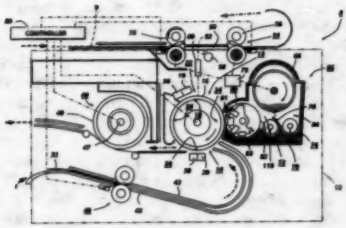
a cable attached to said movable device and wound around said drive member and;

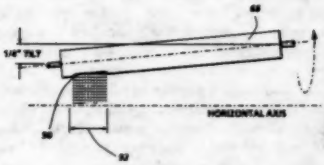
means for securing the cable to two separate locations on said drive member;

said cable including first and second end segments which are spirally wound around said drive member, with the first end segment spiral progressing in one axial direction from one of the securing locations to an adjacent area of the drive member and the second end segment spiral progres-

sing in the opposite axial direction from the other securing location to said adjacent area.

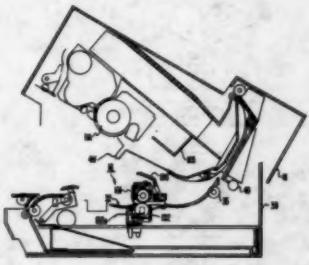
4,965,639
TONER SUPPLY CARTRIDGE FOR REPRODUCTION AND PRINTING MACHINES
Eugene Manno, Ontario, and Joseph G. Mestnik, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Oct. 25, 1989, Ser. No. 426,348
Int. Cl.[5] G03G *15/08*
U.S. Cl. 355—260 2 Claims





1. In a copying/printing machine having a movable recording member on which latent electrostatic images are created, developing means for developing said images with toner, and transfer means for transferring the developed images to a copy substrate material, said developing means including a developer housing adjacent said recording member with means in said housing to bring developer from a sump in said housing into developing relation with said recording member to develop images on said recording member, the combination of:
(a) a tube-like cylinder adapted to contain a supply of fresh toner;
(b) means supporting said cylinder in spaced relation above said sump, the axis of said cylinder being at an angle with respect to the horizontal;
(c) drive means for rotating said cylinder;
(d) said cylinder having a plurality of toner discharge ports extending only along a portion of the length of the cartridge lying beneath the horizontal, and
(e) means for mixing said toner dispensed into said developer housing, said means further adapted to transfer the mixed developer onto said developing means.

4,965,640
IMAGE FORMING APPARATUS INCLUDING DETACHABLE TONER FIXING UNIT
Shinichi Watarai, Yokohama; Makoto Inoue, Kobe, and Keiji Ohyabu, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Mar. 9, 1989, Ser. No. 321,203
Claims priority, application Japan, Mar. 14, 1988, 63-060146
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—283 14 Claims

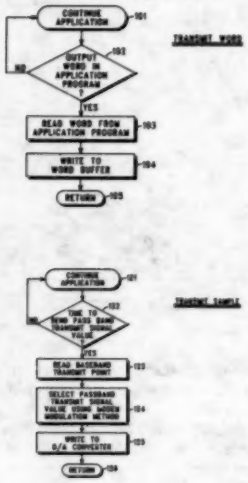


1. Image forming apparatus for forming an image on an image recording sheet, said apparatus comprising:
upper and lower frames;
hinge means hingedly interconnecting the frames and facilitating relative movement thereof between opened and closed conditions;
a toner fixing unit including a base structure, a pair of elongated rollers rotatably mounted on said base structure and disposed in parallel contacting relationship for pinching an image recording sheet carrying a toner image therebetween during rotation of the rollers, and pressure means including a contact element and operable in response to a pressing force applied to the contact element for pressing said rollers toward one another during said rotation thereof to fix the toner image on the image recording sheet;
fastening means for detachably mounting the toner fixing unit on one of the frames; and
a first contact member mounted on the other frame in a position for contacting said contact element to apply said pressing force to the contact element when said frames are in their closed condition and to release said pressing force when said frames are in their open position.

4,965,641
PROCESSOR MODEM
Steven R. Blackwell, Huntsville, Ala.; Steve Polge, Raleigh, N.C.; Danny Windham, Madison, and Melvin Bruce, Huntsville, both of Ala., assignors to Motorola, Inc., Schaumburg, Ill.
Continuation-in-part of Ser. No. 314,671, Feb. 21, 1989. This application May 17, 1989, Ser. No. 353,286
Int. Cl.[5] H04B *1/38*
U.S. Cl. 375—7 18 Claims

1. A method for a processor having an application program and a modem program for receiving output data words from said application program and providing passband transmit signal values, said method comprising the following steps:
(a) determining when said application program has an output data word;
(b) receiving said output data word;
(c) writing said output data byte to a word buffer;
(d) determining when it is time to send a baseband transmit point;
(e) reading at least one information bit from said byte buffer;

(f) selecting a baseband transmit point based at least in part on said at least one information bit and a predetermined method for selecting a baseband transmit point based on at least one predetermined information bit;
(g) writing said baseband transmit point to a baud buffer;
(h) determining when it is time to s end a passband transmit signal value;



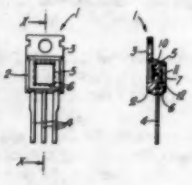
(i) reading said baseband transmit point from said baud buffer;
(j) selecting a passband transmit signal value based at least in part on said baseband transmit point and a predetermined method for selecting a passband transmit signal value based on a predetermined baseband transmit point;
(k) providing said passband transmit signal value.

4,965,642

SEMICONDUCTOR DEVICE HAVING A LASER PRINTABLE ENVELOPE

Joseph B. Titterington, Stockport, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 14, 1986, Ser. No. 851,838
Claims priority, application United Kingdom, Apr. 22, 1985, 8510200
Int. Cl.[5] H01L *23/28, 23/30*
U.S. Cl. 357—72 **6 Claims**



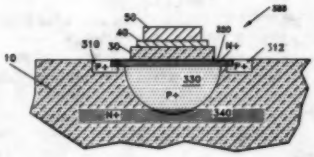
1. A semiconductor device provided with an envelope capable of displaying information upon laser printing, said device comprising a semiconductor element encapsulated in an envelope of a plastics material, said envelope having an exterior surface remote from said semiconductor element characterized in that an insert separated from the semiconductor element by a portion of the envelope is included in the envelope, said insert has a major surface forming a portion of the exterior surface of said envelope and is formed of a material which, upon laser printing, produces markings that are of high contrast to the remainder of the external surface of the envelope.

4,965,643

SCHOTTKY DIODE FOR INTEGRATED CIRCUITS

Guy R. Freeman, Colorado Springs, Colo., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 6, 1989, Ser. No. 319,033
Int. Cl.[5] H01L *29/48*
U.S. Cl. 357—15 **17 Claims**



1. An integrated circuit Schottky diode having a forward turn-on voltage, a dynamic forward resistance and a reverse breakdown voltage and comprising a layer of semiconductor material having an intrinsic bulk conductivity and disposed above an insulating substrate, an anode, and a cathode, said cathode comprising a layer of metal abutting a predetermined first surface of said layer of semiconductor material, characterized in that:

said layer of semiconductor material has a predetermined second surface opposite said first surface and abutting an insulating layer interface of an insulating layer;

a shunt region of said insulating layer interface and a shunt region of said second surface of said semiconductor material are doped with predetermined concentrations of a shunt dopant in a predetermined portion of said insulating layer interface abutting said layer of semiconductor material and extending from a first position opposite said cathode along said insulating layer interface to a second position in proximity to said anode, said predetermined concentration of said shunt dopant being such that said shunt region of said second surface of said semiconductor material has a greater conductivity than said intrinsic bulk conductivity of said layer of semiconductor material;

said anode is connected to said shunt region by a low-impedance electrical path, whereby current flow between said cathode and said anode passes preferentially through said shunt region of said second surface of said semiconductor material; and a high-impedance path is formed along said first surface between said anode and said cathode.

4,965,644

PURE GREEN LIGHT EMITTING DIODES AND METHOD OF MANUFACTURING THE SAME

Toshiharu Kawabata, Kyoto; Susumu Koike, Kawachinagano; Toshio Matsuda, Otsu, and Hitoo Iwasa, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 516,443, Jul. 22, 1983, abandoned. This application Nov. 12, 1985, Ser. No. 797,756
Claims priority, application Japan, Jul. 28, 1982, 57-132735
Int. Cl.[5] H01L *33/00*
U.S. Cl. 357—17 **5 Claims**

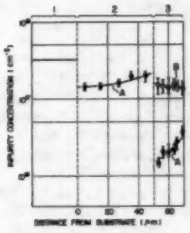
1. A pure green light emitting diode, comprising:

an n-type gallium phosphide substrate;

an n-type gallium phosphide epitaxial layer, said n-type layer being formed overlying said substrate as a liquid phase epitaxial layer; and

a p-type gallium phosphide epitaxial layer grown by a liquid

phase epitaxial process on said n-type layer, said p-type layer containing donor impurities in an average donor concentration less than or equal to 5×10^{16} cm^{-3}, such



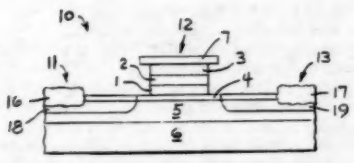
that brightness of said pure green light emitting diode attains a predetermined high brightness value with an emission peak wavelength of 555 nm.

4,965,645

SATURABLE CHARGE FET

Paul M. Solomon, Yorktown Heights, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 20, 1987, Ser. No. 28,640
Int. Cl.[5] H01L *29/80*
U.S. Cl. 357—22 **18 Claims**



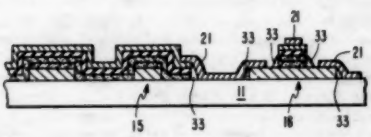
1. A field effect transistor comprising:
source and drain electrodes separated by a channel region and a barrier layer on a semiconductor substrate; and
a semiconductor gate in proximity to the barrier layer, said gate having a first high conductivity semiconductor a layer immediately adjacent said barrier layer, and a second depletable low conductivity semiconductor layer separating said first layer from a third high conductivity semiconductor external contact layer.

4,965,646

THIN FILM TRANSISTOR AND CROSSOVER STRUCTURE FOR LIQUID CRYSTAL DISPLAYS

Alfred C. Ipri, Princeton, and Roger G. Stewart, Neshanic Station, both of N.J., assignors to General Electric Company, Princeton, N.J.

Filed Oct. 21, 1988, Ser. No. 260,845
Int. Cl.[5] H01L *29/78, 27/12*
U.S. Cl. 357—23.7 **5 Claims**



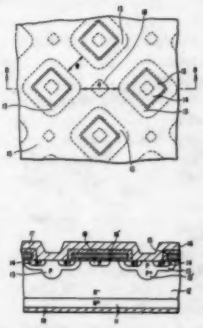
1. A thin film transistor and crossover structure for a liquid crystal display device comprising:
a transparent electrode layer supported by a transparent substrate; said transparent electrode layer being configured into pixel electrodes, drive lines and data lines;
a doped layer over selected portions of said transparent electrode layer for forming source and drain regions for said thin film transistor;
an undoped layer over said doped layer for forming a channel region between said source and drain regions;
a dielectric layer over said undoped layer for forming a gate insulation layer for said thin film transistor;
a first conductive layer over selected portions of said dielectric layer for making electrical connections said pixel electrode, said drive lines and said data lines; and
a second conductive layer over selected portions of said first conductive layer in electrical connection with said first conductive layer and portions of said transparent electrode layer, for forming electrode crossovers and for connecting said pixel electrode to drive circuitry.

4,965,647

VERTICAL MOS FIELD EFFECT TRANSISTOR HAVING A HIGH WITHSTAND VOLTAGE AND A HIGH SWITCHING SPEED

Mitsuasa Takahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 156,152, Feb. 16, 1988, abandoned.
This application May 17, 1989, Ser. No. 355,855
Claims priority, application Japan, Feb. 16, 1987, 62-31426
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.4 **6 Claims**

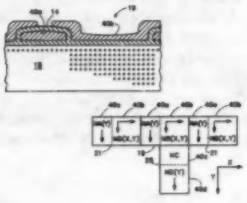


1. A semiconductor device comprising:
a drain region of one conductivity type which is a semiconductor substrate having a main surface and a back surface;
a plurality of base regions of the other conductivity type formed in said drain region from said main surface;
a plurality of source regions of said one conductivity type formed in said base regions, respectively, to define channel regions at peripheries of said base regions, said channel regions having a first depth;
a plurality of auxiliary regions of said other conductivity type formed in said drain region from said main surface between said base regions, said auxiliary regions being separated from said base regions and having a second depth shallower than said first depth;
a gate insulator film formed on said main surface to cover said auxiliary regions, said channel regions and said drain regions between said auxiliary regions and said channel regions;
a gate electrode formed on said gate insulator film;
a source electrode contacting at least said source regions; and
a drain electrode attached to said base surface of said semiconductor substrate.

4,965,648
TILTED CHANNEL, SERIAL-PARALLEL-SERIAL, CHARGE-COUPLED DEVICE

Kei-Wean C. Yang; John E. Taggart; Raymond Hayes, and Joseph R. Peter, all of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 7, 1988, Ser. No. 215,967
Int. Cl.[5] H01L *29/78, 29/34*
U.S. Cl. 357—24 **15 Claims**



1. A charge storage cell for a serial-parallel-serial, charge-coupled device for storing charge carriers and for transferring stored charge carriers in two, non-parallel lateral directions toward two neighboring charge storage cells of the charge-coupled device, the charge storage cell comprising:

a semiconductor substrate;

an insulator layer formed above said substrate; and

an electrode formed above said insulator layer, the substrate including a channel region coextensive with said electrode in the two lateral directions for storing charge carriers and for conducting charge carriers under said electrode in the two lateral directions,

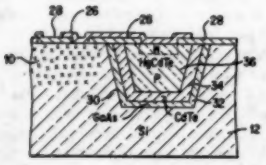
a substantial portion of said channel region having built-in potential gradients tilted in the two lateral directions, and

the tilted built-in potential gradients providing electric fields applying forces in the two lateral directions on charge carriers within said substantial portion of said channel region.

4,965,649
MANUFACTURE OF MONOLITHIC INFRARED FOCAL PLANE ARRAYS

Ken Zanio, El Toro, and Ross C. Bean, Santa Ana, both of Calif., assignors to Ford Aerospace Corporation, Newport Beach, Calif.

Division of Ser. No. 289,959, Dec. 23, 1988. This application Oct. 5, 1989, Ser. No. 417,388
Int. Cl.[5] H01L *27/14, 31/00*
U.S. Cl. 357—30 **1 Claim**



1. A monolithic focal plane array structure including interconnected silicon circuitry and HgCdTe detectors, comprising:

(a) a silicon substrate having silicon signal readout device circuitry formed therein;

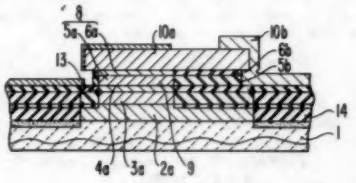
(b) said substrate having recesses formed therein, said recesses being filled with monocrystalline layers of GaAs, CdTe, and HgCdTe formed on top of one another, the surface of said HgCdTe layer being substantially level with the surface of said silicon substrate; and

(c) patterns of insulating material and metallic interconnectors superimposed upon said substrate surface and said HgCdTe layer surface.

4,965,650
BIPOLAR TRANSISTOR AND METHOD OF PRODUCING THE SAME

Masanori Inada, Nara; Kazuo Eda, Hirakata; Yorito Ota, Kobe; Atsushi Nakagawa, Kawanishi, and Manabu Yanagihara, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 30,607, Mar. 27, 1987, abandoned. This application Oct. 11, 1989, Ser. No. 420,656
Int. Cl.[5] H01L *29/72*
U.S. Cl. 357—34 **12 Claims**



1. A bipolar transistor comprising:

a first layer including a collector portion;

a second layer formed on said first layer and including a base portion and an insulating portion;

a third layer, including an emitter portion, formed on a part of said base portion and extending to cover a part of said insulating portion of said second layer; and

an emitter electrode layer formed to cover an entire upper surface of said third layer wherein a part of said emitter electrode layer on a part of said third layer covering a part of saidd insulating portion of said second layer serves as an emitter electrode contact lead.

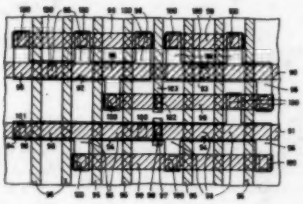
4,965,651
CMOS LOGIC ARRAY LAYOUT

Karl Wagner, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 193,133, May 5, 1988, abandoned, which is a continuation of Ser. No. 260,559, May 5, 1981, abandoned, which is a continuation of Ser. No. 947,922, Oct. 2, 1978, abandoned, which is a continuation of Ser. No. 737,598, Nov. 1, 1976, abandoned, which is a continuation of Ser. No. 617,987, Sep. 29, 1975, abandoned, which is a continuation of Ser. No. 436,186, Jan. 24, 1974, abandoned. This application Mar. 23, 1989, Ser. No. 330,942
Claims priority, application Netherlands, Feb. 1, 1973, 7301433
Int. Cl.[5] H01L *27/102, 27/105*
U.S. Cl. 357—42 **18 Claims**

1. An integrated circuit layout having a common body with a plurality of cells, each cell including a plurality of complimentary transistors, said cells being adjacent each other in a prescribed row on said common body, each cell including a first semiconductor region having a plurality of transistors of one type disposed in a first row aligned with said prescribed row, each cell also including a second semiconductor region having a plurality of transistors of a type complementary to the one type of said associated cell, said complementary types in each cell being disposed in a second row parallel with said first row of said associated cell, each said second row of transistors having the same number of transistors as said first row in its associated cell, said first and second semiconductor regions in

adjacent cells being aligned, respectively, each said transistor having a control electrode and conducting electrodes having a primary current path therebetween, said circuit layout also including two power supply lines in substantially parallel paths, said rows of transistors in each cell being disposed substantially parallel to said power supply lines and being conductively connected thereto, said circuit layout also including signal lines, at least portions of said signal lines being disposed substantially perpendicular to said rows of transistors, said signal lines crossing said power supply lines and being insulated therefrom, said signal lines forming at least in part interconnections for the control electrodes of said rows of transistors, and conductor tracks interconnecting the transistors of each of said rows in circuits in which certain of the transistors



of each row have their primary current paths connected in parallel circuit paths and certain of the transistors of each row have their primary current paths connected in series circuit paths, at least portions of said conductor tracks being disposed substantially parallel to said supply lines, said plurality of cells including at least two cells whose logic circuitry is different from each other, a further conductive track crossing at least one of said two power supply lines while being insulated therefrom, and an additional connection line located between said two power supply lines and being conductively connected to said rows of transistors, said further conductive track contacting said additional connection line and being disposed substantially perpendicular to said two power supply lines and said additional connection line.

4,965,652

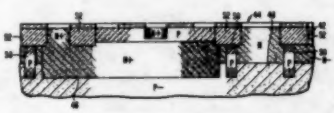
DIELECTRIC ISOLATION FOR HIGH DENSITY SEMICONDUCTOR DEVICES

Ingrid E. Magdo, and Steven Magdo, both of Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 150,609, Jun. 7, 1971. This application Sep. 20, 1972, Ser. No. 290,586

Int. Cl.[5] H01L *27/04*

U.S. Cl. 352—50 **9 Claims**



1. A dielectrically isolated semiconductor device comprising:

a semiconductor substrate of one conductivity type;

an epitaxial layer of the opposite conductivity type on said substrate;

a first buried region of said opposite conductivity type partially in said substrate and said epitaxial layer;

a second buried region of said one conductivity type partially in said substrate and said epitaxial layer;

at least one semiconductor device located in said epitaxial layer above said first buried region; and

a dielectrically isolating region surrounding said semiconductor device and extending from the surface of said epitaxial layer partially through said epitaxial layer to intersect with both said buried regions.

4,965,653

SEMICONDUCTOR DEVICE AND METHOD OF MOUNTING THE SEMICONDUCTOR DEVICE

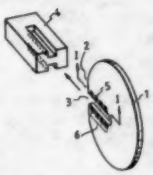
Kanji Otsuka, Higashiyamato; Shigeo Kuroda, Ohme; Katsuyuki Sato, Kodaira; Hisashi Nakamura, Ohme, and Shinichi Shouji, Akishima, all of Japan, assignors to Hitachi, Ltd. and Hitachi VLSI Engineering Corp., both of Tokyo, Japan

Continuation of Ser. No. 210,913, Jun. 24, 1988, abandoned. This application Feb. 28, 1990, Ser. No. 489,714

Claims priority, application Japan, Jun. 26, 1987, 62-157647; Jun. 26, 1987, 62-157649; Sep. 9, 1987, 62-223962; Oct. 14, 1987, 62-257121

Int. Cl.[5] H01L *29/06, 23/48, 23/02, 39/02*

U.S. Cl. 357—55 **21 Claims**



1. A wafer scale semiconductor device comprising:

(a) a wafer scale substrate having a main surface constituted with circuits, a rear surface and a substantially circular peripheral surface;

(b) a slit formed from a part of said peripheral surface to a center of said substrate in a direction of a radius, wherein said slit passes through the main surface to the rear surface; and

(c) a plurality of electrodes disposed along said slit and on said main surface.

4,965,654

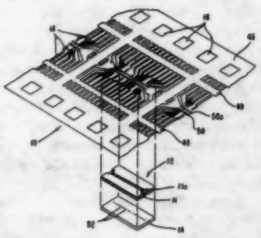
SEMICONDUCTOR PACKAGE WITH GROUND PLANE

Friedrich A. Karner, Milton; Douglas W. Phelps, Jr., Burlington; Stephen G. Starr, Essex Junction, and William C. Ward, Burlington, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1989, Ser. No. 428,533

Int. Cl.[5] H01L *23/48, 23/12, 23/54*

U.S. Cl. 357—70 **9 Claims**



1. An encapsulated semiconductor module comprising:

a semiconductor chip having a major surface with terminals thereon disposed within an encapsulating material;

a plurality of self supporting unitary, discrete, and continuous lead frame conductors formed of metal sheet stock

extending over said major surface of said chip at spaced locations from said terminals, said lead frame conductor extending from said chip and cantilevered out of the encapsulating material;

a ground plane interposed between said lead frame conductors and said major surface and insulatively bonded to said lead frame conductors and said major surface;

discrete electrical conducting means bonded to said conductors and said terminals and electrically connecting said conductors to said terminals, and

at least one electrical conducting means bonded to a selected one of said conductors and to said ground plane.

4,965,655

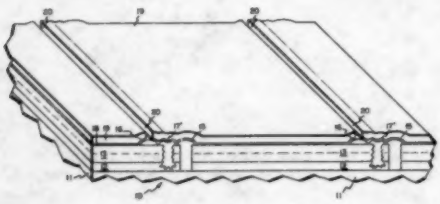
INTERCONNECTED SEMICONDUCTOR DEVICES

Derrick P. Grimmer, White Bear Lake; Kenneth R. Paulson, North St. Paul, and James R. Gilbert, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 131,416, Dec. 10, 1987, Pat. No. 4,873,201. This application Aug. 1, 1989, Ser. No. 388,239

Int. Cl.[5] H01L *23/48, 29/46, 29/54, 29/62*

U.S. Cl. 357—71 15 Claims



1. An interconnected array of semiconductor devices, said array comprising:

a plurality of semiconductor devices arrayed on a substrate each spaced apart from each one adjacent thereto in that said plurality of semiconductor devices by a separating space having therein intervening material means, said plurality of semiconductor devices each having therein a support layer of a first conductive material and a corresponding layer of semiconductor material with first and second major surfaces such that said semiconductor material layer is separated at said second major surface thereof from said substrate by its corresponding support layer, said plurality of semiconductor devices each having a penetrating terminal therein of a second conductive material spaced apart from any said separating space and extending from said support layer therein through said semiconductor material layer therein to emerge at said first major surface of that said semiconductor material layer which remains a unitary electrically conductive body with that said penetrating terminal therethrough; and

a plurality of interconnection layer means comprising at least a third conductive material which is transparent to visible light, said plurality of said interconnection layer means each being in electrical contact with said first major surface of said semiconductor material layer of one of said plurality of semiconductor devices and each further being in electrical contact with a said penetrating terminal where it emerges from said first major surface of said semiconductor material layer in an adjacent one of said plurality of semiconductor devices by having a selected one of that interconnection layer means and that penetrating terminal extend over said intervening material means across a said separating space to to thereby form an electrical interconnection, said third conductive material having an outer surface on a side thereof opposite said semiconductor material layer which is free of any of said intervening material means.

4,965,656

SEMICONDUCTOR DEVICE

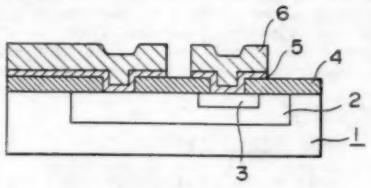
Yasushi Koubuchi; Jin Onuki, and Masahiro Koizumi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 58,321, Jun. 4, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 314,246

Claims priority, application Japan, Jun. 6, 1986, 61-130149

Int. Cl.[5] H01L *23/48*

U.S. Cl. 357—71 12 Claims



1. A semiconductor device comprising a semiconductor substrate of silicon, having integrated circuits therein, a diffusion barrier layer formed on said substrate, and an electrode conductor layer formed of aluminum or aluminum-silicon alloy on said diffusion barrier layer, wherein the diffusion barrier layer is an amorphous material layer formed of an amorphous material having a higher crystallization temperature than a temperature of any heat treatment applied to said semiconductor device after the formation of the amorphous material layer, the amorphous material being of an alloy, or a compound, of at least two metals selected from the group consisting of beryllium, boron, silicon, titanium, manganese, iron, cobalt, nickel, copper, yttrium, zirconium, niobium, molybdenum, ruthenium, rhodium, palladium, hafnium, tantalum, tungsten, rhenium, iridium, thorium, samarium, gadolinium, and terbium, the at least two metals being in a eutectic composition.

4,965,657

RESIN ENCAPSULATED SEMICONDUCTOR DEVICE

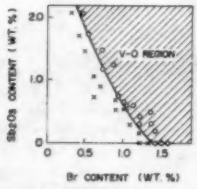
Masatsugu Ogata; Tadanori Segawa, both of Hitachi; Hidetoshi Abe, Katsuta; Shigeo Suzuki, Hitachi, and Tatsuo Kawata, Shimodate, all of Japan, assignors to Hitachi Ltd. and Hitachi Chemical Co., Ltd., both of Tokyo, Japan

Filed Aug. 2, 1988, Ser. No. 227,605

Claims priority, application Japan, Aug. 3, 1987, 62-192684

Int. Cl.[5] H01L *23/28*

U.S. Cl. 357—72 12 Claims



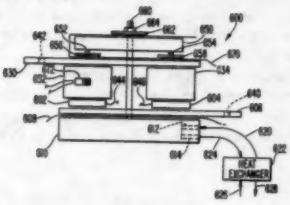
1. In a resin encapsulated semiconductor device sealed with an epoxy resin molding material, the improvement wherein said epoxy resin molding material comprises an epoxy resin, a brominated epoxy resin as a flame retardant, the bromine content in the molding material being 0.5% by weight or less, antimony oxide as a flame retardant in an amount of 2.0% by weight or more, an inorganic particle filler in an amount of 60 to 85% by weight, and a quaternary phosphonium tetrasubstituted borate as a curing accelerator.

4,965,658

SYSTEM FOR MOUNTING AND COOLING POWER SEMICONDUCTOR DEVICES

Dean K. Norbeck, York, and Harold R. Schnetzka, II, Spring Grove, both of Pa., assignors to York International Corporation, York, Pa.

Filed Dec. 29, 1988, Ser. No. 291,780
Int. Cl.[5] H01L 23/42
U.S. Cl. 357—79 30 Claims



1. A system for mounting and cooling one or more semiconductor devices which are subject to a duty cycle including an initial transient period during which the semiconductor device or devices generated heat at a greater rate than during steady-state operation, the system comprising:

conducting terminal means in thermal and electrical conductive contact with at least a first pole of a semiconductor device;

first thermal heat sink means, in thermal conductive contact with said terminal means, for receiving heat generated within the semiconductor device during device operation;

second thermal heat sink means, in thermal conductive contact with said semiconductor device, for receiving heat generated within the semiconductor device during device operation; and

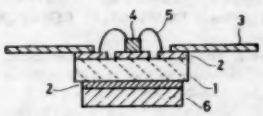
said first and second heat sink means having respective first and second predetermined heat capacities to maintain the semiconductor device or devices at or below a predetermined maximum junction temperature during predetermined transient and steady-state periods of device operation, said first and second predetermined heat capacities being selected such that of the heat generated within the semiconductor device a percentage of heat received by said second thermal heat sink means is greater during the predetermined transient period than during the predetermined steady-state period.

4,965,659

MEMBER FOR A SEMICONDUCTOR STRUCTURE

Akira Sasame; Hitoyuki Sakanoue; Masaya Miyake, and Akira Yamakawa, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 28, 1988, Ser. No. 212,950
Claims priority, application Japan, Jun. 30, 1987, 62-162838; Jun. 30, 1987, 62-162839; Jun. 30, 1987, 62-162840; Jun. 30, 1987, 62-162841
Int. Cl.[5] H01L 23/02
U.S. Cl. 357—81 9 Claims



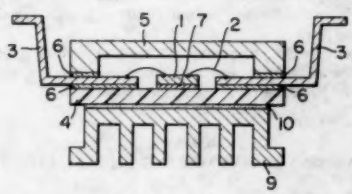
1. A semiconductor structure, comprising a semiconductor device, an insulating substrate formed as an aluminum nitride sintered body having a first major surface facing said semiconductor device, and a heat radiating heat sink joined to said insulating substrate on a second major surface of said insulating substrate opposite said first major surface, said heat radiating heat sink being made of a metal material having a thermal conductivity of at least 120 W/mK and a thermal expansion coefficient within a range of 4 to 6.0×10^{-6}/K, wherein said thermal conductivity and siad thermal expansion coefficient of said heat radiating heat sink are substantially equal to a respective thermal conductivity and thermal expansion coefficient of siad aluminum nitride of said insulating substrate, said metal material of said heat sink being selected from a first group consisting of tungsten and tungsten alloy, said tungsten alloy containing at least one metal selected from a second group consisting of nickel, copper, iron and cobalt, said second group being present in said tungsten alloy in a proportion of not more than ten percent by weight of said tungsten alloy.

4,965,660

INTEGRATED CIRCUIT PACKAGE HAVING HEAT SINK BONDED WITH RESINOUS ADHESIVE

Satoru Ogihara; Hironori Kodama; Nobuyuki Ushifusa, all of Hitachi, and Kanji Otsuka, Higashiyamato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 243,144, Sep. 9, 1988, abandoned, which is a continuation of Ser. No. 68,777, Jun. 29, 1987, abandoned, which is a continuation of Ser. No. 652,910, Sep. 21, 1984, abandoned. This application Jun. 12, 1989, Ser. No. 364,537
Claims priority, application Japan, Sep. 22, 1983, 58-175958
Int. Cl.[5] H01L 23/02
U.S. Cl. 357—81 11 Claims



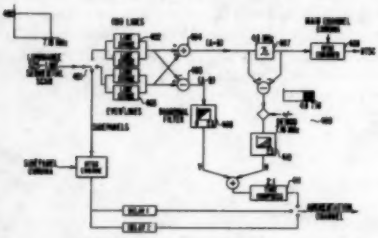
1. In an integrated circuit package comprising an insulating substrate, a cap and a sealing glass sealing the cap with the insulating substrate to form a hermetic casing which encloses at least one semiconductor element mounted on a front surface of the insulating substrate, lead members introduced from the outside of the casing and wires electrically connecting the semiconductor element with end portions of the lead members, and a heat sink bonded to a rear surface of the insulating substrate, the improvement wherein the cap is made of a ceramic material having a thermal expansion coefficient of 40 to 55×10^{-7}/°C.; the sealing glass has a thermal expansion coefficient close to 40 to 55×10^{-7}/°C.; the heat sink has a fin structure and is bonded to the rear surface of the insulating substrate by a silicone resin adhesive having a Young's modulus of 500 kg/cm^2 or less when formed into a film, said silicone resin adhesive containing 20 to 80% by volume of one or more fillers in order to increase its thermal conductivity; the thermal expansion coefficient of the insulating substrate is 35 to 40×10^{-7}/°C., the insulating substrate is made of a sintered body of ceramic material having a thermal conductivity of 0.2 to 0.7 cal/cm.sec.°C. and the heat sink is made of at least one member selected from the group consisting of aluminum and alloys thereof having a thermal expansion coefficient of at least 170×10^{-7}/°C., whereby the sealing glass is prevented from cracking.

4,965,661

METHOD AND APPARATUS FOR INCREASING THE DEFINITON OF AN NTSC VIDEO SIGNAL USING AN AUGMENTATION CHANNEL

Keith Lucas, Richmond Hill, Canada, assignor to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Aug. 4, 1988, Ser. No. 228,274
Int. Cl.[5] H04N *11/00, 7/12*
U.S. Cl. 358—12 22 Claims



1. A method at a transmitter for increasing the definition of a standard resolution video signal using a separate augmentation channel to increase the resolution of the standard resolution video signal, the augmentation channel comprising a line difference signal portion for improving vertical definition, the method characterized by the steps of

generating a line summation signal,

deriving a horizontal detail signal from the line summation signal,

diagonally filtering the horizontal detail signal to provide a horizontal definition portion of the augmentation channel signal, and

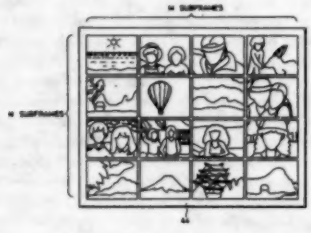
transmitting the horizontal and vertical definition portions of the augmentation channel for increasing the definition of the standard resolution video signal.

4,965,662

VIDEO PRINTER FOR MAKING VIDEO IMAGE HARD COPIES

Kazuo Shiota, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 29, 1988, Ser. No. 225,975
Claims priority, application Japan, Jul. 29, 1987, 62-189387; Jul. 29, 1987, 62-189388
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—78 7 Claims



1. A video printer having a printing unit for obtaining a hard copy of a video image, said video printer comprising:

a first memory for storing one frame of an inputted video signal;

a second memory having a storage capacity X times as large as said first memory in the horizontal scan direction and Y times as large as said first memory in the vertical scan direction, where X and Y are positive integers:

means for making a multifreeze image, comprising M sub-frames in the horizontal scan direction and N sub-frames in the vertical direction, said sub-frames being inlaid within a single frame, by reading the video signal stored in said first memory while thinning said video signal by a first factor of X/M in the horizontal scan direction and by a second factor of Y/N in the vertical scan direction to reduce the size of said video image, and by writing said thinned video signal in a predetermined area of said second memory: and

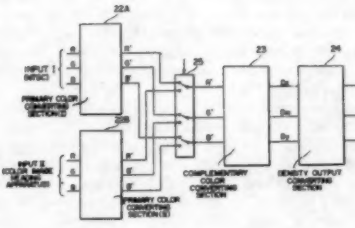
means for reading a video signal from said first memory when a hard copy of one frame video image is to be made, and reading a video image from said second memory when a hard copy of a multifreeze image is to be made.

4,965,663

METHOD FOR MEASURING OF CHROMATIC OPTICAL DENSITY

Takashi Sasaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 348,077, May 1, 1989, abandoned, which is a continuation of Ser. No. 794,184, Nov. 1, 1985, abandoned. This application Feb. 20, 1990, Ser. No. 481,696
Claims priority, application Japan, Nov. 8, 1984, 59-235599; Nov. 15, 1984, 59-242158
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—80 11 Claims



1. A method of optically measuring chromatic densities of a sample, comprising the steps of:

deriving three stimulus values X, Y and Z of light reflected by the sample; and

determining a cyan density, a magenta density and a yellow density of the sample using said stimulus values X, Y and Z derived and three stimulus values X_0, Y_0 and Z_0 of a standard color.

4,965,664

COLOR IMAGE SIGNAL PROCESSING METHOD AND APPARATUS FOR RECORDING A COLOR IMAGE FROM INPUT COLOR IMAGE SIGNALS BY CONVERTING AN INDIVIDUAL COLOR SIGNAL COMPONENT

Yoshiro Udagawa, Tokyo, and Hideo Takiguchi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Japan

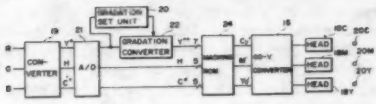
Filed Aug. 12, 1987, Ser. No. 84,185
Claims priority, application Japan, Aug. 15, 1986, 61-190585; Aug. 18, 1986, 61-192587; Oct. 21, 1986, 61-248366
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—80 33 Claims

1. A color image signal processing apparatus comprising:

input means for inputting analog color image signals;

means for obtaining an analog luminance signal, an analog

hue signal, and an analog chroma signal based on said analog color image signals; and



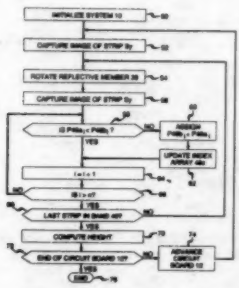
conversion means for converting said analog luminance signal, said analog hue signal and said analog chroma signal into digital signals.

4,965,665

3D IMAGING OF A SUBSTRATE USING PERPENDICULAR SCANNING DIRECTIONS

Israel Amir, Ewing, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 25, 1989, Ser. No. 426,366
Int. Cl.[5] H04N 7/18
U.S. Cl. 358—101 **9 Claims**



1. A method for obtaining a three-dimensional image of a substrate comprising the steps of:

(a) training a linescan camera onto the surface of a substrate normal to its plane so that a strip of area, running across the surface of the substrate parallel to a first axis, is within the field of view of the camera so the camera may capture the image thereof;

(b) spanning the substrate, along a second axis perpendicular to the first axis, with a line of light parallel to the first axis, the line of light being directed at the surface of the substrate at an angle to successively illuminate each of a plurality of contiguous strips of area, including the strip within the field of view of the linescan camera;

(c) simultaneously capturing the image of the strip within the field of view of the camera each time a successive one of the plurality of strips is illuminated by the line of light;

(d) processing the successive images captured by the linescan camera to establish a three-dimensional image of the strip within its field of view; and

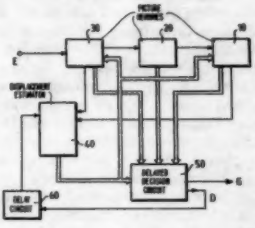
(e) imparting a relative motion between the linescan camera and the substrate along the second axis to obtain a three-dimensional image of the substrate.

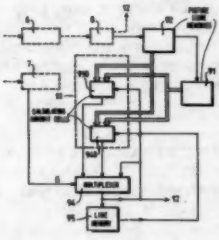
4,965,666

METHOD OF AND ARRANGEMENT FOR ESTIMATING AND COMPENSATIING MOTION IN A SEQUENCE OF PICTURES AND A PICTURE TRANSMISSION SYSTEM PROVIDED WITH SUCH AN ARRANGEMENT

Mohammad-Réza Haghiri, Sceaux, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 23, 1988, Ser. No. 276,185
Claims priority, application France, Nov. 27, 1987, 87 16477
Int. Cl.[5] H04N 7/18, 7/12
U.S. Cl. 358—105 **33 Claims**





1. A method of estimating and compensating motion in a sequence of pictures in which the brightness of each picture element is expressed digitally, characterized in that each picture is divided into blocks of I×J elements, each of these blocks being defined by two coordinates (m, n) which denote the rank m of the picture line in which a block is located and the position n of the block in this m^{th} line, respectively, and in that said method comprises:

(A) preserving three consecutive pictures in the sequence of initial pictures, denoted by the respective ranks 2k, 2k+1, 2k+2;

(B) defining for the blocks three groups in which they are classified, a first group wherein said blocks are estimated by corrected horizontal recursion, a second group wherein said blocks are estimated by non-corrected horizontal recursion and a third group wherein said blocks are estimated by vertical recursion, in which groups the blocks will be classified, with a delay of L blocks, in accordance with the progressing picture scan, by examining, to effect said classification, a predetermined number of sequences of possible groups for the L blocks subsequent to the considered current blocks X, the criterion on which this classification is based being the difference in brightness between two pictures in the sequence of pictures, taking the displacement which occurs between one picture and another into account;

(C) forming a classifying tree whose three branches seen at each branching point are equal in number to those of the possible groups and whose 3^L branches occurring as a result thereof at each successive level 1 to L correspond to

the sequences of possible groups for the L consecutive considered blocks

(D) assigning two parameters to each branch of each level:

(a) a first parameter, the displacement vector, which is representative of any displacement of the current block of the picture 2k+1 relative to the preceding and subsequent pictures 2k and 2k+2 and is calculated for the element which is representative of said block with the aid of a recursive displacement estimation method;

(b) a second parameter, the accumulated distortion parameter, which is representative of the accumulated sum of the approximation error of the current block and those of the preceding blocks in the number L of blocks, each approximation error being rendered minimal by taking into account the influence of an estimated displacement for a block on the displacement estimated for the L subsequent blocks, and said influence possible not being investigated, among the 3^L possible branches of the classifying tree, with the exception of M branches of the weakest accumulated distortion, referred to as surviving branches, M being a limited number less than the maximum number of branches 3^L;

(E) taking, at the end of this method, as regards L consecutive blocks in the scanning direction, a majority decision as regards the effective group of the block which, relative to the current block, is located L blocks earlier, said decision being taken by examining the surviving branches and by classifying said blocks situated L blocks earlier in the group to which the majority of surviving branches correspond, and said decision procedure being repeated in an identical manner with the exception of the L last blocks for which no majority decision is taken.

4,965,667

METHOD AND APPARATUS FOR PROCESSING SIGNALS CONVEYED IN SUB-SAMPLED FORM BY WAY OF A TRANSMISSION CHANNEL OR RECORD CARRIER

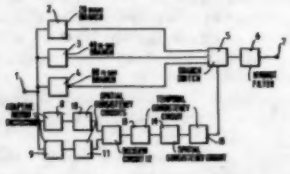
Timothy I. P. Trew, Horley, England, and Franciscus W. P. Vreeswijk, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

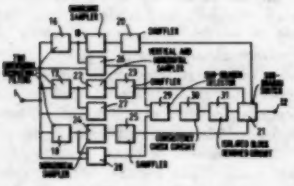
Filed Dec. 7, 1988, Ser. No. 281,294

Claims priority, application United Kingdom, Dec. 22, 1987, 8729878

Int. Cl.[5] H04N 7/12

U.S. Cl. 358—138 **45 Claims**





1. A method of processing a signal representing a two-dimensional image conveyed in sub-sampled form by way of a transmission channel or record carrier and subjected, prior to said conveyance, to different sampling structures on a segmented basis depending on movement and/or spatial information, said method comprising the steps of:

i. receiving the sub-sampled signal from said transmission channel or record carrier,

ii. subjecting each segment of the received signal to adaptive interpolation filtering capable of providing at any time the appropriate one of a number of spatial frequency filter responses each of which approximates one of a plurality of decimation spatial frequency filter responses to which said signal would have been subjected prior to sub-sampling for said conveyance,

iii. subjecting the resulting interpolated signal to sub-sampling on a segmented basis depending on the movement and/or the spatial information but where pixels adjacent to but outside a segment are sub-sampled in accordance with a sampling structure relevant to that segment, and

iv. subjecting each segment of the resulting sub-sampled signal to non-adaptive interpolation filtering capable of providing at any time the appropriate one of the number of spatial frequency filter responses each of which substantially corresponds to one of the plurality of the said decimation filter responses to reproduce said signal.

4,965,668

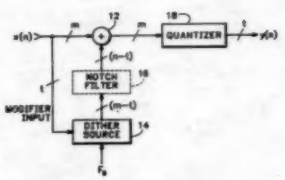
ADAPTIVE ROUNDER FOR VIDEO SIGNALS

John Abt, Nevada City, and James A. Delwiche, Grass Valley, both of Calif., assignors to The Grass Valley Group, Inc., Nevada City, Calif.

Filed Nov. 9, 1989, Ser. No. 433,882

Int. Cl.[5] H04N 5/14; H03M 1/20

U.S. Cl. 358—160 **6 Claims**



1. An adaptive rounder for reducing the number of bits between an input digital signal and an output digital signal comprising:

means for generating a dither signal having a number of bits equal to the difference in the number of bits between the input and output digital signals, the dither signal being a function of a modifier input signal derived from the input digital signal; and

means for combining the dither signal with the input digital signal to produce the output digital signal.

4,965,669

APPARATUS FOR DIGITALLY CONTROLLING THE D.C. VALUE OF A PROCESSED SIGNAL

Barth A. Canfield, Indianapolis, Ind., and Russell T. Fling, Naperville, Ill., assignors to RCA Licensing Corporation, Princeton, N.J.

Filed Apr. 12, 1989, Ser. No. 335,195

Int. Cl.[5] H04N 5/18

U.S. Cl. 358—171 **6 Claims**

1. In combination:

PCM signal input means for providing a PCM signal;

D.C. control input means for providing a D.C. control signal;

digital-to-analog converting means having input and output ports;

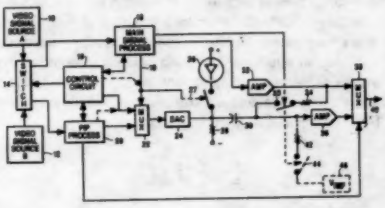
a capacitor having a first electrode coupled to the output

port of said digital-to-analog converting means, and having a second electrode for providing an output signal;

a source of reference potential;

offset potential means selectably operable to establish an offset potential at said first electrode; and

means including means for concurrently coupling said D.C.



control signal to the input port of said digital-to-analog converting means and said reference potential to said second electrode only during predetermined first intervals and for coupling said PCM signal to the input port of said digital-to-analog converting means and conditioning said offset potential means to establish said offset potential at said first electrode during second predetermined intervals.

4,965,670

ADJUSTABLE OVERLAY DISPLAY CONTROLLER

Gary M. Klinefelter, Eden Prairie, Minn., assignor to Research, Incorporated, Eden Prairie, Minn.

Filed Aug. 15, 1989, Ser. No. 393,998

Int. Cl.[5] H04N 5/272

U.S. Cl. 358—183 **21 Claims**

1. A video display control system for controlling presentation of varying patterns of pixels on a screen of a display monitor in response to selected commands from a control means directing presentations of such pixel patterns as a sequence of lines of sequential pixels, said pixel patterns comprising a composite of both relatively infrequently changing background pixel patterns based on corresponding background data supplied by said control means, and relatively frequently changing foreground pixel patterns based on corresponding foreground data supplied by said control means, said control means comprising:

a background data memory means for receiving at data inputs thereof signals from said control means for at least temporary storage therein representing said background data, and, upon receiving corresponding command signals at command inputs thereof from said control means including receiving an indication of a selected line in said sequence of lines, being capable of providing at outputs thereof signals representing a selected portion of said background data corresponding to said selected line sufficient to supply a basis for forming portions of those background pixel patterns that are to appear in said selected line in locations therein devoid of portions of said foreground pixel patterns, said command inputs thereof and said data inputs thereof at least in part being electrically connected to said control means;

a foreground data memory means for receiving at data inputs thereof signals from said control means for at least temporary storage therein representing said foreground data, and, upon receiving corresponding command signals at command inputs thereof, being capable of providing at outputs thereof signals representing a selected portion of said foreground data corresponding to a designation thereof sufficient to provide a basis for specifying in a line in said sequence of lines where, in that line, portions of said foreground pixel patterns for that line are to be provided and where they are to be omitted, said data inputs thereof at least in part being electrically connected to said control means;

a relative position memory means for receiving at data inputs thereof signals from said control means for at least temporary storage therein representing at least one designation of a portion of said foreground data selected to correspond with at least one line of said sequence of lines, and upon receiving corresponding command signals at said command inputs thereof from said control means including receiving said indication of a selected line, being capable of providing at outputs thereof signals representing that designation corresponding to said selected line, said command inputs thereof and said data inputs thereof at least in part being electrically connected to said control means and said outputs thereof at least in part being electrically connected to said foreground data memory means command inputs; and

a display monitor controller means for receiving at data inputs thereof signals, from said background data memory means and said foreground memory means, indicating a pattern of said sequential pixels for said selected line, and being capable of providing at outputs thereof signals for directing a display monitor to provide such a pattern of sequential pixels in said selected line on a screen thereof by providing said portions of foreground pixel data patterns where in said selected line they are specified to be provided and, where they are specified to be omitted, provided corresponding said portions of background pixel patterns, said display monitor controller means data inputs being at least in part electrically connected to said background data memory means outputs and said foreground data memory means outputs.

4,965,671

PICTURE PICK-UP DEVICE INCLUDING A SOLID-STATE SENSOR AND AN ELECTRONIC SHUTTER OPERATING WITH A MINIMUM AND MAXIMUM NUMBER OF RESET PULSES

Pieter B. Dielhof, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Jun. 9, 1988, Ser. No. 204,648

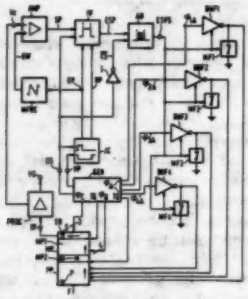
Claims priority, application Netherlands, Jun. 26, 1987, 8701498

Int. Cl.[5] H04N 3/15, 5/235

U.S. Cl. 358—213.13 **6 Claims**

1. A picture pick-up device including a solid-state sensor and an electronic shutter, which sensor comprises a picture pick-up member including a matrix of picture pick-up elements, a storage member coupled to said picture pick-up member, said storage member including a matrix of storage elements, and a parallel-in, series-out shift register member coupled to said matrix of storage elements, said parallel-in, series-out shift register member including at least one row of shift register elements which is coupled to a picture signal output of the sensor for supplying a picture signal occurring at line scanning periods, line blanking periods, field scanning periods and field blanking periods, said sensor to this end being coupled to a control circuit for supplying control signals for obtaining, after an effective picture information integration period at the pick-up member, a parallel information frame transfer effected in a frame transfer period from the picture pick-up member to the storage member during a field blanking period and for subsequently obtaining a periodically occurring parallel information

shift effected during a line blanking period from the storage member to the shift register member in which a serial information shift to the picture signal output is subsequently effected during a line scanning period, the electronic shutter operating with a periodical resetting during a variable part of the maximum available picture information integration period at the picture pick-up member with the aid of a series of reset pulses occurring during line blanking periods and to be supplied by a



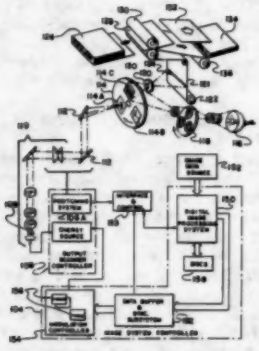
pulse generator which is present in the control circuit, characterized in that said pulse generator is adapted to supply a maximum number of reset pulses, which maximum number occurs in a period which is shorter than the maximum available picture information integration period minus the frame transfer period, said maximum number being greater than or equal to a minimum number regardless of the duration of the variable part with the periodical resetting of the period.

4,965,672

METHOD AND APPARATUS FOR HALFTONE IMAGING

Ronald J. Duke, Miamisburg, Ohio; Sun Lu, San Jose, Calif.; James R. McLaughlin, Kettering, and Eric Walowit, Miamisburg, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed May 11, 1987, Ser. No. 48,156
Int. Cl.[5] H04N *1/036, 1/23, 1/46;* **G01D** *15/14*
U.S. Cl. 358—298 **28 Claims**



1. Imaging apparatus for producing on an imaging media an image made up of marks varying in at least one of size, density and shape, said apparatus comprising:

data source means for providing image data defining an image to be produced on said imaging media;

data processing means for receiving said image data and for converting said image data into amplitude and pulse width signals;

writing means responsive to said amplitude and pulse width signals for controlling an energy source to write marks on said imaging media varying in at least one of size, density and shape;

said writing means including a writing beam and means for scanning said beam over said imaging media;

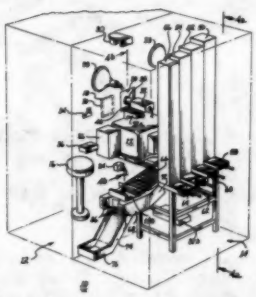
said writing means further including a beam sensitive light valve upon which said writing beam is scanned to produce marks thereon varying in one of size, density and shape, and exposure means for transferring said marks from said light valve to said imaging media.

4,965,673

APPARATUS FOR A VIDEO RECORDING BOOTH

Suzanna D. Bozzo, and Ronald W. Thomas, both of Tucson, Ariz., assignors to Eyzon Corporation, Tucson, Ariz.

Filed Oct. 4, 1988, Ser. No. 253,248
Int. Cl.[5] H04N *5/782*
U.S. Cl. 358—335 **30 Claims**



1. A booth for making a video recording on a video cassette, said booth comprising in combination:

(a) a recording studio for accommodating at least an occupant of whom the recording is to be made;

(b) an equipment compartment for housing the apparatus for making the recording of the occupant of said recording studio;

(c) said equipment compartment including:

(i) a television camera for capturing an image of the occupant of said recording booth;

(ii) a recorder for recording the image captured by said television camera upon the video cassette;

(iii) a changer for loading and unloading said recorder with the video cassette;

(iv) at least one stack of video cassettes and including means for serially dispensing the video cassettes from each of said at least one stack to said changer;

(v) means for discharging the video cassette from said changer to a recipient; and

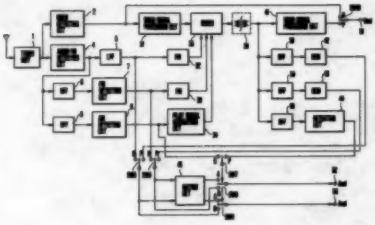
(d) means for controlling the operation of said television camera, said changer, said recorder and said stack.

4,965,674

RECORDING AND REPRODUCING SYSTEM WITH SELECTIVE MATRIX CONVERSION

Kenichi Nagasawa, and Taizou Hori, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1988, Ser. No. 265,753
Claims priority, application Japan, Nov. 10, 1987, 62-284566; Dec. 7, 1987, 62-310010
Int. Cl.[5] H04N 5/76
U.S. Cl. 358—341 18 Claims



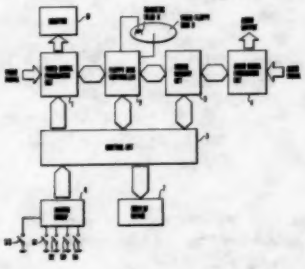
1. An audio signal recording system comprising:
(a) receiving means for receiving a transmission signal including a modulated signal for a sum signal of left and right signals of a stereophonic audio signal and a modulated signal for a difference signal of said left and right signals;
(b) demodulating means for demodulating said modulated signal for said sum signal and said modulated signal for said difference signal which are included in said transmission signal that has been received by said receiving means; and
(c) recording means for recording on a recording medium said sum signal and said difference signal which have been demodulated by said demodulating means without converting said sum signal and said difference signal into said left and right signals.

4,965,675

METHOD AND APPARATUS FOR AFTER-RECORDING SOUND ON A MEDIUM HAVING PRE-RECORDED VIDEO THEREON

Masashi Hori, and Shigeo Yamagata, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1988, Ser. No. 193,369
Claims priority, application Japan, May 15, 1987, 62-119303; Jul. 31, 1987, 62-191871; Jul. 31, 1987, 62-191872
Int. Cl.[5] H04N 5/76, 5/781
U.S. Cl. 358—341 19 Claims



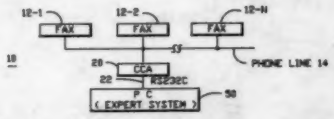
1. A recording apparatus for recording information signals and corresponding additional signals to be reproduced together with said information signals, on storage means in a positionally mixed form, comprising:
(a) recording means for recording said additional signals on said storage means; and
(b) reproducing means for reproducing from said storage means information signals corresponding to said additional signals in advance of the recording of said additional signals by said recording means.

4,965,676

FACSIMILE REMOTE DIAGNOSTIC SYSTEM

Koichi Ejiri, Santa Clara; Tina Jeng, San Jose; Rithy Roth, Richmond, and Lak M. Lam, San Jose, all of Calif., assignors to Ricoh Corporation and Ricoh Company, Ltd., San Jose, Calif.

Filed Feb. 28, 1989, Ser. No. 317,190
Int. Cl.[5] H04H 1/00
U.S. Cl. 358—406 6 Claims



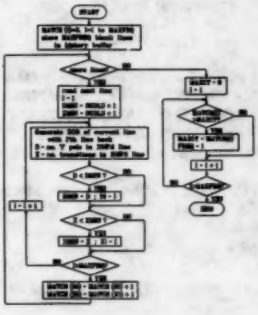
1. A remote facsimile diagnostic system comprising
one or more facsimile apparatus,
remote diagnostic means for remotely communicating with each of said facsimile apparatus including communication,
adapter means for controlling communications with said facsimile apparatus,
a telephone line connected between each of said facsimile apparatus and said remote diagnostic means, and
remote control means for providing remote diagnostics of each of said facsimile apparatus through said communication adapter means over said telephone line wherein said control means is a programmed personal computer, including means for storing programmed control instructions for providing diagnostics to said facsimile apparatus.

4,965,677

COMPRESSION OF BINARY HALFTONES

William B. Pennebaker, Carmel; Karen L. Anderson, Mohegan Lake, and Joan L. V. Mitchell, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 1, 1989, Ser. No. 305,313
Int. Cl.[5] H04H 1/41
U.S. Cl. 358—429 10 Claims



1. A method of compressing an image, consisting of a plurality of lines of picture elements with intensities that vary with

respect to each other forming patterns having a periodicity of H lines, comprising the steps of:

reformatting said image by concatenating the first H lines in sequence to form a single line, concatenating the next H lines in sequence to form a second line, and

repeating this process of concatenating the next H lines in sequence until the entire image has been so reformatted; and

applying a compression algorithm which makes use of directional correlations to compress said reformatted image.

4,965,678

AREA DESIGNATION APPARATUS IN IMAGE PROCESSING SYSTEM

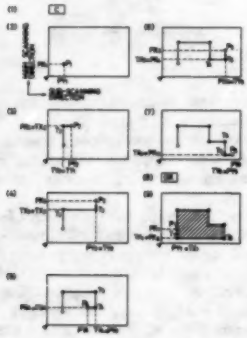
Masanori Yamada, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1988, Ser. No. 162,943

Claims priority, application Japan, Mar. 3, 1987, 62-047952; Mar. 3, 1987, 62-047953

Int. Cl.[5] H04N *1/387*

U.S. Cl. 358—452 **40 Claims**



1. An area designation apparatus comprising:

means for inputting coordinates of an area for image processing, said input means having a first input method for inputting two diagonal points of a rectangular and/or square area, and a second input method for inputting coordinates of at least three corners of a polygonal area; and

control means for determining an area on the basis of the coordinates input by said input means, said control means automatically discriminating whether the input method of the input coordinates by said input means is the first input method or the second input method.

4,965,679

METHOD FOR ELECTRONICALLY DUPLICATING FILM IMAGES WHILE MAINTAINING A HIGH DEGREE OF IMAGE QUALITY

Roger R. A. Morton, Penfield, and Joseph T. Olesik, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 27, 1989, Ser. No. 316,197

Int. Cl.[5] H04H *1/40*

U.S. Cl. 358—462 **5 Claims**

1. A method for duplicating a microfilm image comprising the steps of:

generating a first video signal by scanning an Nth generation image;

processing said video signal to generate binary video data representing said Nth generation image;

generating a first series of parameters representative of the generated binary video data;

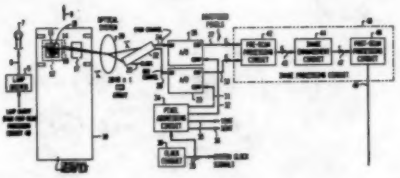
storing said first series of parameters; and

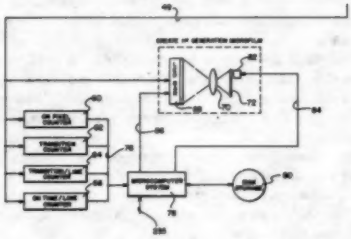
electronically writing an N+1 generation image using the generated video signal;

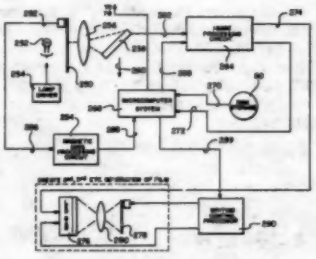
generating a binary video signal by scanning an N+Mth generation image;

processing said video signal to generate binary video data representing the Nth+Mth generating image;

generating an N+Mth series of parameters representative of the generating binary video signal;







comparing said N+Mth series of parameters with said stored parameters from the Nth generation to produce an adjustment signal;

adjusting said N+Mth video signal in response to said adjustment signal; and

electronically writing N+Mth+1 generation images using the adjusted video signal.

4,965,680

APPARATUS FOR RELEASING A RESTRICTION ON THE RECORDING OF AN INFORMATION SIGNAL ON A RECORDING MEDIUM

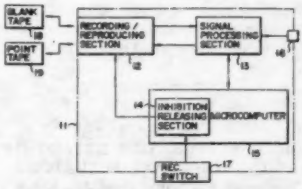
Kenjiro Endoh, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 30, 1988, Ser. No. 214,129

Claims priority, application Japan, Jun. 30, 1987, 62-163002; Jun. 30, 1987, 62-163021; Jun. 30, 1987, 62-163022; Jan. 20, 1988, 63-9883; Jan. 20, 1988, 63-9884

Int. Cl.[5] G11B *15/04*

U.S. Cl. 360—60 23 Claims



1. An apparatus for releasing a restriction on the recording of an information signal on a recording medium, comprising:

a first recording medium which allows the information signal to be recorded;

a recording device for recording said information signal on said first recording medium;

restriction means for restricting the recording of said information signal by the recording device on said first recording medium;

a release-signal-holding medium composed of a second recording medium for allowing the recording and reproduction of a release signal for releasing the recording restriction of said restriction means, said release signal including frequency data for restricting a quantity of said information signal which may be recorded on said first recording medium when the recording restriction of said restriction means has been released; and

releasing means for releasing the recording restriction placed by the restricting means based on said release signal of said release-signal-holding medium.

4,965,681

MAGNETIC RECORDING APPARATUS OF ROTARY MAGNETIC TYPE HAVING CROSS-TALK CANCELLING FUNCTION

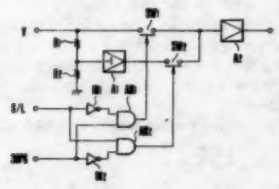
Hiroyuki Takimoto, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 8, 1989, Ser. No. 320,907

Claims priority, application Japan, Jun. 12, 1985, 60-126223; Jun. 12, 1985, 60-126224; Jun. 12, 1985, 60-126225; Jun. 12, 1985, 60-126226

Int. Cl.[5] G11B *15/14*

U.S. Cl. 360—64 12 Claims



1. A magnetic recording apparatus including a rotary magnetic head for recording an information signal on a magnetic recording medium and a rotary erasing head arranged to trace the magnetic recording medium ahead of the recording magnetic head so that an information signal recorded on said magnetic recording medium is erased by said rotary erasing head and then an information signal is recorded by said rotary magnetic head, comprising:

(A) erasing signal generating means for generating an erasing signal to be fed to said rotary erasing head;

(B) record information signal generating means for generating a record information signal to be fed to said rotary magnetic head;

(C) first coupling means for electrically coupling said rotary erasing head with said erasing signal generating means to enable the erasing signal generated by said erasing signal generating means to be fed to said rotary erasing head;

(D) second coupling means for electrically coupling said rotary magnetic head with said record information signal generating means to enable the record information signal generated by said record information signal generating means to be fed to said rotary magnetic head; and

(E) record information signal correcting means for correcting said record information signal generated by said record information signal generating means, by using a phase-inverted erasing signal obtained by inverting the phase of said erasing signal generated by said erasing signal generating means in the case where said erasing signal is fed from said erasing signal generating means through said first coupling means to said rotary erasing head during a period when said record information signal is recorded on said magnetic recording medium by said rotary magnetic head and feeding said record information signal through said second coupling means to said rotary magnetic head.

4,965,682

SPEED CONTROL DEVICE

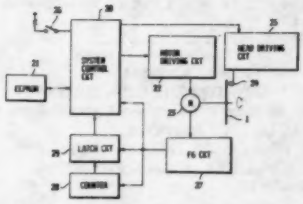
Shigeru Jinnai, and Nobuo Fukushima, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1989, Ser. No. 320,987

Claims priority, application Japan, Mar. 11, 1988, 63-057757; May 31, 1988, 63-131740

Int. Cl.[5] G11B *19/247*; H02P *5/06*

U.S. Cl. 360—73.03 25 Claims



1. A speed control device for controlling the speed of a motor by a feedback control system including a proportion term proportional to information on a deviation of the speed of the motor from a speed set value and an integration term obtained by integrating the information on the deviation with respect to time, comprising:

(A) motor driving means for rotating said motor in a plurality of load conditions including a reference load condition;

(B) memory means for storing a value of the difference in the integration term obtained between when said motor has come into a stationary rotation state in said reference load condition and when said motor has come into the stationary rotation state in a load condition other than said reference load condition in each of said plurality of load conditions; and

(C) control means for controlling a rotation of said motor by using a value of the difference in the integration term

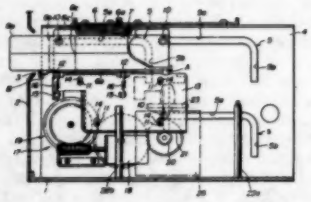
stored by said memory means and corresponding to the load condition in which said motor in.

4,965,683

CASSETTE LOADING DEVICE FOR RECORDING AND/OR REPRODUCING APPARATUS

Takahide Otani, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 21, 1989, Ser. No. 326,731
Claims priority, application Japan, Mar. 28, 1988, 63-073553
Int. Cl.[5] G11B *15/02, 15/08, 15/675*
U.S. Cl. 360—94 15 Claims



1. A cassette loading device for a recording and/or reproducing apparatus, capable of loading tape cassettes of a plurality of sizes, comprising;

a cassette holder capable of moving between an insertion position, in which said tape cassette is inserted into said recording and/or reproducing apparatus, and a loading completed position, in which a tape cassette is positioned onto a positioning means and a pair of tape reels engage with a reel driving means;

cassette holder driving means for driving said cassette holder;

detection means for detecting which size of tape cassette has been inserted into said recording and/or reproducing apparatus; and

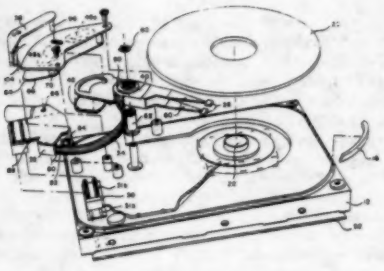
torque control means for controlling the driving torque of said cassette holder driving means in response to a detection signal which is outputted from said detection means and indicative of which size of tape cassette has been inserted.

4,965,684

LOW HEIGHT DISK DRIVE

Frederick M. Stefansky, Longmont, Colo., assignor to Conner Peripherals, Inc., San Jose, Calif.

Filed Jan. 25, 1988, Ser. No. 147,804
Int. Cl.[5] G11B *5/55, 5/012*
U.S. Cl. 360—78.12 26 Claims



1. A disk drive including a base plate, a rotatable storage medium, interactive means for reading and writing information on said storage medium, electrical interface means for making electrical interconnections between said interactive means and control means, and a cover sealably attached to said base plate to provide a controlled environment for said storage medium and said interactive means, characterized in that:

said disk drive lies in a first plane;

said base plate lies in a second plane, said second plane making an angle greater than zero degrees with said first plane; and

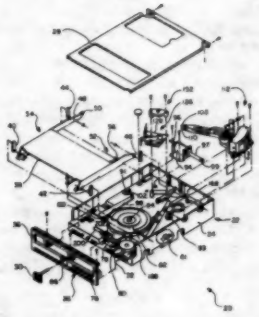
said base plate has first and second ends, a top, and a bottom, and said interactive means is provided on said top and at said first end of said base plate and said electrical interface means is provided on said bottom and at said second end of said base plate to reduce the dimensions of the disk drive in the direction normal to said first plane.

4,965,685

REMOVABLE CARTRIDGE DISC DRIVE WITH RADIAL ARM VOICE COIL ACTUATOR

Herbert E. Thompson, Los Gatos; Donald L. Rolph, Pleasanton; Dominic Mercurio, San Jose, and Albert J. Guerini, Gilroy, all of Calif., assignors to Syquest Technology, Fremont, Calif.

Division of Ser. No. 160,708, Feb. 26, 1988, Pat. No. 4,870,518.
This application Jul. 3, 1989, Ser. No. 359,385
Int. Cl.[5] G11B *5/016*
U.S. Cl. 360—97.01 21 Claims



1. A disc drive for selectively receiving a cartridge containing a rotatable memory disc comprising:

a disc drive housing with a cartridge receiving door;

a head assembly for transferring data between the disc drive and the disc;

said head assembly including at least one data transfer head;

said head assembly including means for pivotally mounting said head to said housing for causing selected radial movement of the head relative to the disc;

first head loading means for loading the head onto the disc and for supporting said head;

first mounting means for pivotally mounting said first head loading means to said housing for radial movement toward the disc;

first biasing means for biasing said first head loading means toward the disc; and

second head loading means for loading said head onto the disc in a more accelerated manner than caused by said first head loading means;

second mounting means for pivotally mounting said second head loading means to said housing for radial movement toward the disc; and

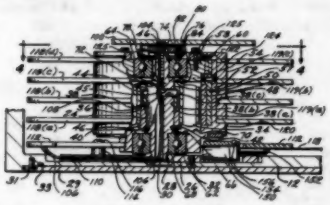
second biasing means for biasing said second head loading means toward the disc.

4,965,686

DISC DRIVE ASSEMBLY FOR MAGNETIC DISC MEMORY UNIT

Paul R. Young, Cromwell; David W. Richard, Meriden; Arthur J. Treff, East Hartford, and Christopher E. Staehly, East Haddam, all of Conn., assignors to Raymond Engineering Inc., Middletown, Conn.

Filed Mar. 31, 1989, Ser. No. 331,462
Int. Cl.[5] G11B 17/08
U.S. Cl. 360—98.07 11 Claims



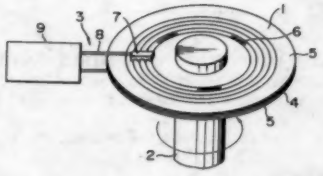
1. A disc drive assembly including:
base plate means;
spindle shaft means fixed to said base plate means at a first end of said spindle shaft means;
stator means positioned around said spindle shaft means;
mounting means for mounting said stator means on said spindle shaft means, said mounting means including;
a first wedge member fixed to said stator means;
a second wedge member around said spindle shaft means and mating with said first wedge member, and loading means loading said second wedge member against said first wedge member;
rotor means around said stator means;
bearing means positioned between said spindle shaft means and said rotor means to rotatably support said rotor means for rotation about said means and spindle means; and
a plurality of discs mounted in spaced apart relationship on said rotor means.

4,965,687

MULTIHEAD MAGNETIC DISK DEVICE FOR A MAGNETIC DISK MEMORY

Hideo Fujiwara, Ibaraki, Japan, assignor to Hitachi Maxell Ltd., Ibaraki, Japan

Filed Sep. 15, 1988, Ser. No. 244,860
Claims priority, application Japan, Sep. 18, 1987, 62-232633
Int. Cl.[5] G11B 21/21, 5/60
U.S. Cl. 360—103 7 Claims



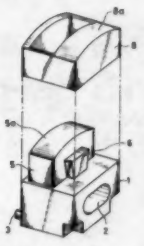
1. A magnetic disk memory comprising a magnetic disk and a magnetic head device adapted to record and/or reproduce information using said magnetic disk as a recording and/or reproducing medium having a defined recording and/or reproducing area, said magnetic head device being comprised of at least three magnetic heads rigidly mounted on one slider, said at least three magnetic heads being arranged in a radial direction of said magnetic disk at an equal pitch corresponding to a distance determined by dividing a radius of said defined recording and/or reproducing area of said magnetic disk by the number of magnetic heads, said magnetic head device being adapted to be moved by said pitch or distance.

4,965,688

PERMANENT MAGNET TYPE ERASING HEAD

Tuyoshi Yoshino, Kameoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 222,045, Jul. 21, 1988, abandoned. This application Mar. 23, 1990, Ser. No. 498,478
Claims priority, application Japan, Nov. 2, 1987, 62-277618
Int. Cl.[5] G11B 5/127, 5/325
U.S. Cl. 360—118 2 Claims



1. A permanent magnetic type erasing head comprising:
a body formed from a resin-magnet material said body including means for mounting to audio equipment and also including a unitary magnet member having an end face defining a first tape contact surface and at least one side face defined in a plane substantially perpendicular to a plane of said first tape contact surface said magnet member having a protrusion extending from said side face in a direction substantially perpendicular to said plane of said at least one side face, said protrusion including a relatively large portion and a relatively small portion, said relatively small portion being spaced from said plane of said first tape contact surface a distance greater than said relatively large portion; and
a protection member formed around said magnetic member with said protrusion, said protection member having an end face defining a second tape contact surface coplaner with and surrounding said first tape contact surface, said protection member being made of a nonmagnetic resin material, said protection member interlock with said protrusion so as to fix said protection member with respect to said magnet member.

4,965,689

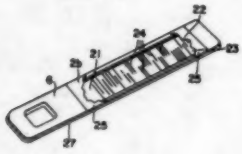
THIN, PLANAR SHAPED CARRIER WITH WIEGAND WIRES

Norbert Normann, Pforzheim; Erwin Grous, Karlsruhe, and Harald Schlager, Rheinstetten, all of Fed. Rep. of Germany, assignors to Dodsco Kg. Dr. Eugen Durrwachter, Pforzheim, Fed. Rep. of Germany

Division of Ser. No. 116,638, Nov. 3, 1987, Pat. No. 4,862,303. This application Jun. 15, 1989, Ser. No. 366,642
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637320
Int. Cl.[5] G11B 5/74
U.S. Cl. 360—131 8 Claims

1. A thin, generally planar-shaped carrier in which two parallel rows of mutually parallel Wiegand wires or wire-shaped bistable magnetic elements exhibiting similar characteristics are embedded which extend transversely to the longitudinal direction of the rows, for use in a magnetic reader having a slot which is limited by guide parts and into which the carrier

is introduced for reading and which defines the direction of movement of the carrier, said magnetic reader having two permanent magnets which are arranged in the vicinity of the slot in such a manner that the magnetic field generated by them has, behind one another in the direction of movement, two zones with oppositely directed field strength vectors extending transversely to the direction of movement, including an inductive sensor, wherein two E-shaped ferromagnetic cores extending transversely to the direction of movement are provided for forming a sensor, said cores being located on opposite long sides of the slot and the three legs of which are directed towards the long side of the slot, said two cores carrying on their center legs an electrical sensor winding, a north pole face of the first permanent magnet being connected to a first flux concentrating piece, and a south pole face of the second permanent magnet being connected to a second flux



concentrating piece, these two flux concentrating pieces being located on different sides of the main plane extending perpendicularly to the long side of the slot and containing its longitudinal center line and their free ends facing each other, a south pole face of the first permanent magnet and a north pole face of the second permanent magnet being connected to one another by a third flux concentrating piece, the E-shaped cores being arranged between free ends of the first two flux concentrating pieces on one hand and the third flux concentrating piece on the other hand, and the cores and the free ends of the first two flux concentrating pieces being arranged symmetrically with respect to the longitudinal center line of the slot which is an axis of symmetry having two-fold symmetry, wherein said carrier has two large surfaces, and Wiegand wires are located closer to one than to the other one of the two large surfaces.

4,965,690

TAPE CASSETTE HAVING OUTER HOUSING LAYERS OF ELASTOMERIC MATERIAL

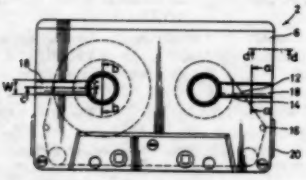
Kimio Tanaka, Saku, and Haruo Shiba, Komoro, both of Japan, assignors to TDK Corporation, Japan

Filed Dec. 21, 1988, Ser. No. 287,842

Claims priority, application Japan, Dec. 24, 1987, 62-194827[U]; Mar. 7, 1988, 63-29214[U]

Int. Cl.[5] G11B *23/02*

U.S. Cl. 360—132 **5 Claims**



1. In a tape cassette having a housing, said housing having a front end and including upper and lower half housing sections each of which is comprised of an inner housing layer with an outer surface and an outer housing layer formed integrally on the outer surface of the inner housing layer, said upper and lower half housing sections defining a space between the inner housing layers for containing a tape and reels on which the tape is wound or unwound and having guide members located close to the front end of the housing to guide the tape, the improvement wherein the outer housing layers on the housing sections are molded from a thermoplastic elastomeric material.

4,965,691

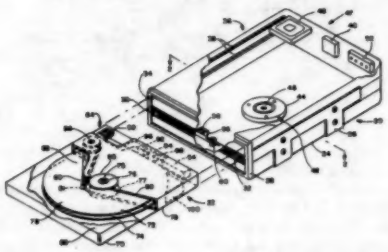
SEALED REMOVABLE CARTRIDGE FOR USE WITH A HIGH DENSITY DISC DRIVE WITH MAGNETIC CLUTCH

Syed H. Iftikar, and John J. Mandish, both of Fremont, Calif., assignors to Syquest Technology, Fremont, Calif.

Filed Nov. 14, 1988, Ser. No. 270,005

Int. Cl.[5] G11B *23/03, 33/14, 5/55*

U.S. Cl. 360—133 **45 Claims**



1. A sealed cartridge adapted for selective use in a disc drive which disc drive has a first electromagnetic actuator means, said sealed cartridge comprising:

a sealed housing;

a disc positioned in said housing;

a magnetic head positioned in said housing adjacent said disc so that data can be transmitted to or read from said disc;

means for rotationally mounting said disc in said housing;

second electromagnetic actuator means attached to said magnetic head within said sealed housing, the first electromagnetic actuator means spaced from said second electromagnetic actuator means with the cartridge located in the disc drive, said second electromagnetic actuator means for moving said magnetic head relative to said disc due to an electromagnetic field produced between said second electromagnetic actuator means and the first electromagnetic actuator means; and

magnetic coupling means for magnetically coupling said disc to the disc drive, in order to allow the disc drive to rotate said disc, without the magnetic coupling means physically touching the disc drive.

4,965,692

OVERLOAD DETECTOR AND PROTECTION CIRCUIT

Robert V. Burns, and Sanjay Gupta, both of Phoenix, Ariz., assignors to Siemens Transmission Systems, Inc., Phoenix, Ariz.

Filed Jul. 31, 1989, Ser. No. 387,194

Int. Cl.[5] H02H *7/122*

U.S. Cl. 361—18 **5 Claims**

1. A power unit having overload protection, comprising:

an input section for providing a digital power input signal representing a power output to be supplied to a load;

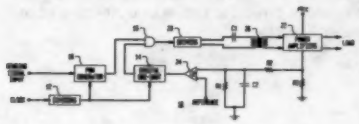
an AND gate having one input to which said digital power input signal is applied, another input to which a digital power enable signal is applied, and an output for providing a digital power output signal when both said digital power input signal and said digital power enable signal are applied at a "high" logic level;

a power amplifier stage for providing a power output to a

load in response to said digital power output signal from said AND gate;

sensing means for sensing a current level corresponding to the power output of said power amplifier stage, and for producing a current level voltage based thereon;

a comparator for comparing said current level voltage with a reference voltage representing a predetermined safe current level, and for producing an output indicative of when the current level of the power output exceeds the predetermined safe current level;



digital timing-out means having an input coupled to the output of said comparator, and having an output for normally providing the digital power enable signal at a "high" logic level to said AND gate and for providing the digital power enable signal at a "low" logic level to said AND gate for a predetermined period of time when the output of said comparator indicates that the current level of the power output has exceeded the predetermined safe current level.

4,965,693

ELECTRICAL APPLIANCE WITH ELECTRICAL HAZARD PROTECTION

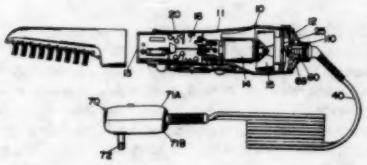
Kazuhisa Aoki, Hikone, Japan, assignor to Matsushita Electric Works, Ltd., Japan

Filed Nov. 14, 1989, Ser. No. 435,761

Claims priority, application Japan, Nov. 15, 1988, 63-288193

Int. Cl.[5] H02H *3/16*

U.S. Cl. 361—42 **12 Claims**



1. In an electrical appliance with short-circuit hazard protection comprising:

a plug unit connected to a source of electricity;

a feed cord extending from said plug unit to feed an electric current to said electrical appliance;

first hazard sensor means provided within said appliance to detect an electrical hazard condition or short-circuiting condition caused by the presence of moisture, water, or like conductive medium entering said appliance;

interrupting circuit means provided within said plug unit, said interrupting circuit means connected to said first hazard sensor means and operating to disconnect said appliance from said source of electricity in response to the detection of said electrical hazard condition;

the improvement comprising:

said feed cord provided at its one end with a connector terminal including a set of first, second, and third conductors, said first and second conductors respectively connected to corresponding leads in said electrical appliance for energizing said, appliance, and said third conductor cooperating with at least one of said first and second conductors to form second hazard sensor means which detects a like electrical hazard condition around said connector terminal by the presence of moisture, water, or like conductive medium and which causes said interrupting circuit means to disconnect said feed cord from said source of electricity.

4,965,694

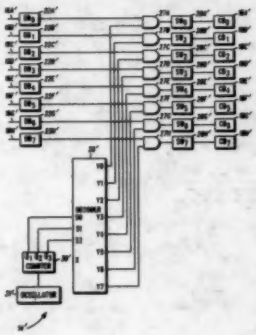
REMOTE CONTROLLED CIRCUIT BREAKER SYSTEM

Robert F. Dvorak, Mount Vernon, Iowa, and Kurt W. Swenson, Lexington, Ky., assignors to Square D Company, Palatine, Ill.

Filed Mar. 30, 1989, Ser. No. 331,430

Int. Cl.[5] H02H *3/30*; H02J *13/00*

U.S. Cl. 361—64 **25 Claims**



21. A method for controlling a plurality of circuit breakers in response to actuation signals from a plurality of separate control lines, each of said control lines being associated with a preselected number of said circuit breakers, said method comprising the steps of:

polling each of said control lines for a predetermined period of time;

coupling a control line being polled to said preselected number of circuit breakers associated therewith for said predetermined period of time; and

actuating said preselected number of circuit breakers being associated with said control line being polled in response to an actuation signal being polled.

4,965,695

PERMANENT MAGNETIC RETAINING DEVICE TO MOVE, AFFIX OR CARRY FERROMAGNETIC PARTS OR LOADS WITH ELECTRONIC SWITCHING OF THE MAGNETIC FLUX TO RELEASE THE CARRIED LOAD

Joseph D. Baumann, Rua Indore, 14, Sao Paulo, Brazil

Filed May 20, 1988, Ser. No. 197,046

Claims priority, application Brazil, May 22, 1987, 8702929

Int. Cl.[5] H01F *7/04*

U.S. Cl. 361—142 **5 Claims**

1. A permanent magnet retaining device to move, affix or carry ferromagnetic parts or loads comprising:

a central iron core;

a pair of magnet blocks enclosing said central iron core;

a plurality of iron shoes connected to said magnet blocks and functioning to secure said magnet blocks;

a plurality of reinforcing plates connected to said magnet blocks;

two lateral poles connected respectively to said pair of magnet blocks and spaced away from said central iron core;

a sliding cover situated above both of said poles and having a lifter eyelet;

a pair of guide pins on which said sliding cover moves;

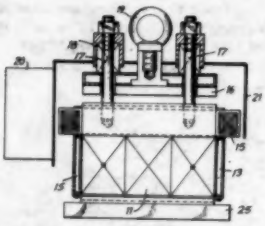
a plurality of mechanical force gauges respectively located adjacent to said guide pins;

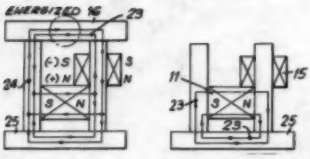
an overcover surrounding said two lateral poles;

an electronic control circuit situated in a side wall of said overcover;

a sensor located remotely from said electronic control circuit, said sensor functioning to receive information from said plurality of mechanical force gauges and functioning to transmit information to said electronic control circuit; and

at least one compensator coil, one of said at least one compensator coils being situated on top of one of said two lateral poles.





4,965,696

VOLTAGE DOUBLING DRIVING CIRCUIT FOR CONTROLLING A FIELD EFFECT TRANSISTOR HAVING A SOURCE LOAD

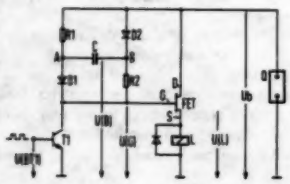
Hans-Georg Kumpfmueller, Donaustauf, and Joachim Schaefer, Straubing-Kagers, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 23, 1989, Ser. No. 425,573

Claims priority, application European Pat. Off., Oct. 27, 1988, 88117942.8

Int. Cl.[5] H01H *47/00*

U.S. Cl. 361—160 **7 Claims**



1. An output stage, comprising:

a voltage source providing an operating voltage with respect to a reference potential;

a series circuit connected between the operating voltage and the reference potential comprising a source-drain path of a field effect transistor and a load;

an electronic switch having a control input, said electronic switch being connected between a gate of the field effect transistor and the reference potential; and

a voltage doubling circuit comprising a series connection of a first diode, a capacitor, and a second diode between the operating voltage and said switch, and wherein a first resistor is connected in parallel to the series connection of the second diode and capacitor, and a second resistor is connected in parallel to the series connection of the capacitor and first diode.

4,965,697

SOLID STATE PRESSURE SENSORS

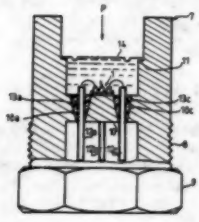
Vincent Mosser, Vanves, and Jean-Louis Robert, Le Cres, both of France, assignors to Schlumberger Industries, Montrouge, France

Filed Mar. 29, 1989, Ser. No. 330,249

Claims priority, application France, Mar. 30, 1988, 88 04175; Mar. 30, 1988, 88 04176

Int. Cl.[5] G01L *9/12*

U.S. Cl. 361—283 **29 Claims**



5. A hydrostatic pressure transducer comprising:

(a) at least one semiconductor layer including at least three elements from columns III and V of the periodic table, the electrical resistance of said layer being pressure sensitive and having a value representative of pressure at a constant temperature, said pressure sensitive layer being integral with a substrate including at least two of said three elements; and

(b) a temperature sensor formed on the same substrate as said pressure sensitive layer and proximate thereto, whereby said temperature sensor is capable of supplying a signal representative of the temperature of said pressure sensitive layer.

4,965,698

CAPACITANCE HUMIDITY SENSOR

Paul E. Thoma, Wauwatosa, and Jeannine O. Colla, Mequon, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Sep. 27, 1989, Ser. No. 414,129

Int. Cl.[5] H01G *7/00, 5/20*; G01N *27/12*

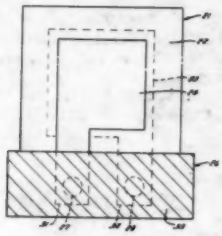
U.S. Cl. 361—286 **47 Claims**

30. A humidity sensor element, comprising:

a thin, flexible film consisting essentially of a dielectric, water-absorbing first polymer made of poly(parabanic acid) having a dielectric constant which varies substantially linearly as a function of relative humidity; and

a pair of water-permeable, conductive layers disposed on opposite sides of said film and integrally bonded thereto,

said conductive layers each consisting essentially of a second polymer having electrically conductive particles



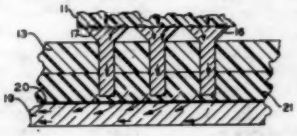
distributed therein, which conductive particles are effective to render said layers electrically conductive.

4,965,699

CIRCUIT CARD ASSEMBLY COLD PLATE

Ralph Z. Jorden, Cherry Hill, N.J., and Ronald S. Lenig, Corrales, N. Mex., assignors to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Apr. 18, 1989, Ser. No. 339,568
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—387 **5 Claims**



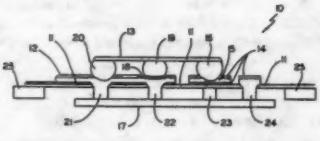
1. In combination with a circuit board having electrical components mounted on one side thereof with electrical component leads extending therethrough, a thermally conductive electrically insulating coating on the surface of the circuit board opposite the side having the electrical components, and a heat dissipating member having a generally flat surface in good thermal contact with the coating whereby heat generated by an electrical circuit component is conducted by the component leads from the component to the coating and then conducted by the coating from the component leads to the heat dissipating member.

4,965,700

THIN FILM PACKAGE FOR MIXED BONDING OF CHIPS

Donald G. McBride, Binghamton, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 199,228, May 26, 1988, abandoned.
This application Sep. 18, 1989, Ser. No. 408,959
Int. Cl.[5] H05K *1/00*
U.S. Cl. 361—398 **5 Claims**



1. A thin, flexible package structure for an electrical circuit with a substrate for affixing a plurality of devices by different bonding processes to minimize effects of a mismatch in coefficients of thermal expansion in electrical connections between the devices and the electrical circuit, comprising:

a flexible substrate formed of a predetermined electrically insulating material and having a plurality of openings formed therethrough at predetermined positions;

electrical circuit means formed on and supported by said flexible substrate and formed of a predetermined electrically conductive chromium-copper-chromium material with said chromium removed at first and second predetermined locations;

a first plurality of bonding pad areas at said first predetermined locations on said electrical circuit means for affixing predetermined inner leads thereof to at least one electrical device for functionally operating with said electrical circuit means, said bonding pad areas being adapted for a predetermined type of bonding process; and

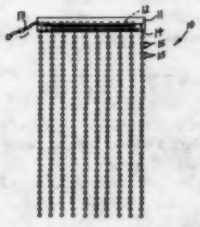
a second plurality of bonding pad areas on the opposite side of said flexible substrate from said electrical circuit means at said positions of said openings matching said second predetermined locations, said second plurality of bonding pad areas being adapted for affixing predetermined inner leads of said electrical circuit means to at least one electrical device for functionally operating with said electrical circuit means by a bonding process different from said predetermined type.

4,965,701

ILLUMINATION CURTAIN KIT APPARATUS

Nora H. B. Voland, 1609 8th St., N.E. Apt. 307, Auburn, Wash. 98002

Filed Feb. 5, 1990, Ser. No. 475,411
Int. Cl.[5] F21V *7/04*
U.S. Cl. 362—32 **6 Claims**



1. An illumination curtain kit apparatus comprising, in combination,

an elongate horizontal support housing including an aligned series of openings formed through a bottom surface of the housing, and

a series of equally spaced, flexible members suspended downwardly through the openings, and

a series of equally spaced translucent illumination members symmetrically and surroundingly mounting portions of the flexible member, and

illumination means mounted within each illumination member to direct light therethrough.

4,965,702

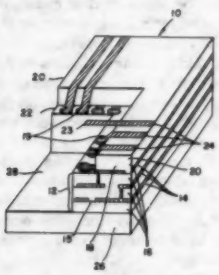
CHIP CARRIER PACKAGE AND METHOD OF MANUFACTURE

John W. Lott, Durham; Thomas R. Poulin, Cary, and Patrick W. Wallace, Chapel Hill, all of N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 19, 1989, Ser. No. 368,481
Int. Cl.[5] H05K *1/18*
U.S. Cl. 361—401 **13 Claims**

1. A layered chip carrier package comprising:

(a) a receptacle containing side walls forming a recess adapted to hold a chip in a fixed relationship
(b) a first plurality of electrical conductors present in a plane wherein a portion of each electrical conductor terminates at or adjacent to one of the side walls of the receptacle to enable electrical contact with a second plurality of electrical conductors,
(c) a first insulating layer which faces one surface of the first plurality of electrical conductors,
(d) a second insulating layer which faces an opposite surface of the first plurality of electrical conductors and separates



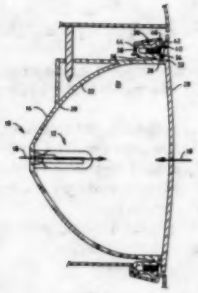
the first plurality from the second plurality of electrical conductors whereby the second insulating layer terminates in a wall adjacent but separate from a side wall of the receptacle whereby terminal portions of the first plurality of electrical conductors are exposed,
(e) the second plurality of electrical conductors present in a plane facing the second insulating layer wherein terminal portions of at least a portion of the plurality of electrical conductors initially in the plane are bent to make electrical connection with the first plurality of electrical conductors.

4,965,703

VIBRATION SUPPRESSING HEADLAMP CLIP

Greg R. Whalen, No. Vernon, Ind., assignor to GTE Products Corporation, Danvers, Mass.

Filed Nov. 20, 1989, Ser. No. 439,131
Int. Cl.[5] F21V *15/04*
U.S. Cl. 362—61 **14 Claims**



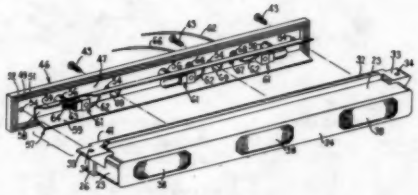
1. A vehicle lamp housing comprising:
(a) a reflector defining a cavity to contain a light source sufficient to provide light for a vehicle,
(b) a retaining clip coupled to the reflector to assist in positioning and retaining the lamp housing in relation to a vehicle, the retaining clip having a first clip end, a flexible body, and a second clip end, and
(c) a vibration damping cross link coupled between the first clip end coupleable to a vehicle along an insertion direction and the second clip end coupled to the reflector.

4,965,704

RUNNING BOARD LIGHT

David B. Osborne, Sr., Elkhart, Ind., assignor to Continental Accessories, Inc., Sturgis, Mich.

Filed Jun. 9, 1989, Ser. No. 364,709
Int. Cl.[5] B60Q *1/24*; F21V *21/00*
U.S. Cl. 362—81 **4 Claims**



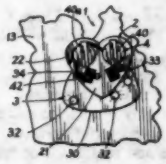
1. A light assembly, comprising:
means defining an elongated housing made of a unitary material, said housing means including first means thereon defining an elongate recess therein, said recess having side wall means and a bottom wall of generally a uniform first wall thickness, said bottom wall having at least one region of a second wall thickness which is less than said first wall thickness so as to render the material of said housing means more transparent to rays of light than said regions of said first wall thickness;
second means defining an opening into said recess on a side of said housing means remote from said bottom wall;
fastener receiving means on said housing means and unitary with said material thereof, said fastener receiving means including plural laterally spaced upstanding and parallel posts on said bottom wall, each having a third means defining fastener receiving openings thereon;
cover receiving means on said housing means encircling said opening into said recess;
cover means for covering said opening into said recess, said cover means having a rim means thereon encircling said cover means adjacent the perimeter thereof and adapted to be received in said cover receiving means to effect a sealing connection of said cover means to said housing means;
an elongated reflector, generally U-shaped in cross section, and mounting means on said cover means for facilitating a mounting of said reflector on said cover means, said U-shape of said reflector opening in a direction facing away from said cover means, said reflector having fourth means defining plural openings therein axially aligned with said posts and receiving said posts therethrough, said cover means including fifth means defining plural openings therethrough axially aligned with said posts and said fastener receiving openings;
light bulb means mounted on said reflector; and
fastener means received in said openings in said cover means and operatively coupled in said fastener receiving openings for effecting a securing of said cover means to said housing means, with said reflector and light bulb means being received in said recess, said U-shape of said reflector opening in a direction toward said transparent bottom wall of said housing means with said light bulb means being positioned immediately adjacent said region of said bottom wall whereat said material is at a second wall thickness so that light caused by an illumination of said light bulb means will be caused to pass through said second wall thickness of material.

4,965,705

ELECTRONIC BADGE HAVING DOUBLE-EFFECT PINS

Wen-Tsung Lin, P.O. Box 74-9, Taipei, Taiwan

Filed Mar. 19, 1990, Ser. No. 495,397
Int. Cl.[5] F21L *15/08*
U.S. Cl. 362—103 5 Claims



1. An electronic badge comprising:

a front plate having decorative figures printed or formed on its front surface, a plurality of illuminating holes formed through the plate;

a button having a base formed with two pin holes in said base and

a housing for covering the base, shaped or marked to be distinguishable from an elevational or inverted state of the button;

a power source formed in said button having a positive clip connected to a positive pole of a battery and a negative clip connected to a negative pole of the battery; and

an illuminating means including a flasher integrated circuit formed on a printed circuit board fixed on a rear surface of said front plate, a plurality of illuminators connected to and driven by said flasher integrated circuit, a first pin operatively engaging said positive clip of said power source and connected to a positive input pin of said flasher integrated circuit through a forward-biased diode, and a second pin operatively engaging said negative clip of said power source and connected to a negative input pin of said flasher integrated circuit, said first pin and said second pin of said illuminating means served for passing through a wearer's clothes and two said pin holes in said button for engaging two said clips of said power source fixed in said button for coupling said front plate with said button, said forward-biased diode of said illuminating means having an anode connected to said first pin and having a cathode connected to said positive input pin of said flasher integrated circuit, whereby upon an engagement of said first pin with said positive clip of said power source and an engagement of said second pin with said negative clip of said power source for keeping the button at its elevational state, a forward current is led through said diode to power said flasher integrated circuit for flashing said illuminators, and whereby upon a withdrawal of said button from said two pins and an inversion of said button to engage said second pin with said positive clip of said power source and engage said first pin with said negative clip, said flasher integrated circuit is not powered to switch off said illuminators.

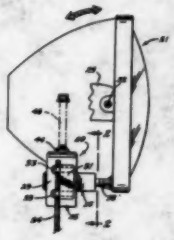
4,965,706

HEADLAMP ADJUSTING MECHANISM

Bernard F. Reiland, 15 Crestwood La., Rockford, Ill. 61107

Filed Jul. 17, 1989, Ser. No. 380,501
Int. Cl.[5] B60Q *1/06*
U.S. Cl. 362—66 10 Claims

1. The combination of, a frame, a vehicle headlamp, and mechanism for adjusting said headlamp relative to said frame, said mechanism comprising a housing secured to said frame, a link extending from said housing and connected to said headlamp, said link being movable linearly relative to said frame and being operable when moved to adjust said headlamp with respect to said frame, and selectively operable means for moving said link linearly in opposite directions, said means comprising a first cam connected to said link and supported in said housing to move linearly along a first path, a second cam supported in said housing to move linearly along a second path extending substantially perpendicular to said first path, an adjusting screw rotatably supported by said housing in a fixed axial position and threadably connected to said second cam,



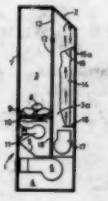
said screw being operable when rotated in opposite directions to move said second cam in opposite directions along said second path, and coacting cam surfaces on said cams and engageable with one another to cause said first cam to move in opposite directions along said first path when said second cam is moved in opposite directions along said second path.

4,965,707

APPARATUS FOR SIMULATING FLAMES

Brian J. Butterfield, Dublin, Ireland, assignor to Basic Engineering Ltd., Eire, Ireland

Filed Feb. 5, 1990, Ser. No. 478,151
Claims priority, application United Kingdom, Feb. 10, 1989, 8921001
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—96 19 Claims



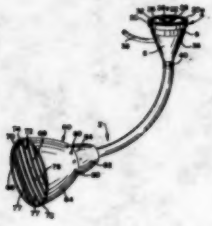
1. Apparatus for simulating flames, the apparatus comprising a source of light, simulated flame effect means for reflecting said light to simulate flames, simulated fuel means to simulate a bed of combusting fuel, and screen means on which to view an image of the simulated flames, said screen means being positioned between said flame effect means and said simulated fuel means, said screen means being capable of diffusely transmitting light reflected by said flame effect means and also being capable of reflecting light from said simulated fuel means so that the simulated flames appear to emanate between the simulated fuel means and an image of the latter means reflected in said screen means.

4,965,708

LIGHT ASSEMBLY HAVING A MAGNETIZED BASE

Jean-Marie W. Louis, Leuvensesteenweg 146, 3210 Tielt-Winge, Belgium

Filed Sep. 6, 1988, Ser. No. 241,049
Int. Cl.[5] F21L 15/18
U.S. Cl. 362—398 7 Claims



1. A light assembly comprising

base means for attachment to a magnet for magnetically affixing said base means to a support object,

said base means further having a magnet holder for holding said magnet,

a light socket for receiving a lamp,

said lamp socket being connected to said base means by a flexible gooseneck connection,

said magnet is in the form of a disk,

said magnet holder is in the form of a dish having a circular flat base and a continuous rim projecting away from said base, said magnet being affixed to said base within said rim,

the edge of said rim projects beyond a face of said magnet,

said base means includes an enclosed hollow housing having a lower member enclosing said housing adjacent said magnet holder, said enclosed housing further including an upper opening for coupling to said flexible gooseneck connection, said magnetic holder being affixed to said lower member, and

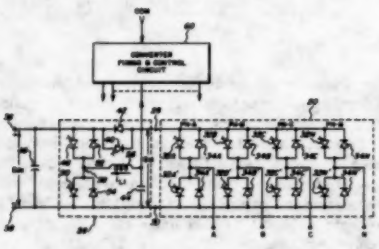
said magnet has a central opening providing access to the base of said magnet holder, attachment means being positioned in said opening and attaching said base of said magnet holder to said lower member for attachment to or removal of said magnet holder from said lower member.

4,965,709

SWITCHING CONVERTER WITH PSEUDO-RESONANT DC LINK

Khai D. T. Ngo, Gainesville, Fla., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 25, 1989, Ser. No. 412,033
Int. Cl.[5] H02M 4/451
U.S. Cl. 363—37 16 Claims



1. A DC to AC converter including an inverter having input terminals and a plurality of controllable switches coupled to said input terminals and adapted to provide regulated output power, and a DC link for coupling a source of DC input power to said inverter, the converter comprising:

first controllable switching means in the DC link for selectively coupling DC input power to the inverter input terminals;

capacitance means coupled to the inverter input terminals in a manner to be charged to the voltage of the DC input power when said first controllable switching means is in conduction;

second controllable switching means;

inductive means serially coupled to said second controllable switching means, the series combination of said second switching means and said inductor being connected in a current discharge path with said capacitance means for establishing a pseudo-resonant discharge of said capacitance means; and

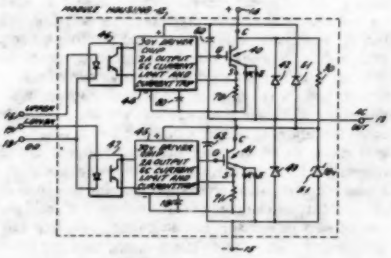
control means for providing gating signals to each of the plurality of controllable switches in the inverter and to said first and second controllable switching means, said control means gating said first controllable switching means out of conduction immediately prior to each time a gating signal is applied to one or more of the controllable switches in said inverter, said control means further gating said second controllable switching means into conduction after gating said first controllable switching means out of conduction and before changing any gating signals to said inverter to force a discharge of said capacitance means and remove input power to said inverter during switching of said controllable switches of said inverter.

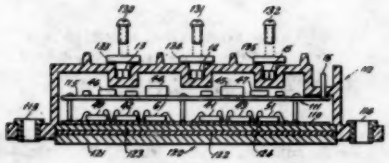
4,965,710

INSULATED GATE BIPOLAR TRANSISTOR POWER MODULE

Brian R. Pelly, Palos Verdes Estates; Ajit Dubhashi, Torrance, both of Calif., and Peter R. Ewer, Oxted, England, assignors to International Rectifier Corporation, El Segundo, Calif.

Filed Nov. 16, 1989, Ser. No. 438,094
Int. Cl.[5] H02M 7/5387
U.S. Cl. 363—56 17 Claims





1. A semiconductor device power module comprising, in combination a conductive heat sink, a plurality of power semiconductor die mounted in thermal conductive relation with

said conductive heat sink; each of said power semiconductor die having a pair of main power terminals and a control terminal operable to turn its respective die on and off; a control circuit semiconductor device for each of said power die; said control circuit semiconductor devices having input terminals and output terminals; said output terminals of said control circuit semiconductor devices being connected between at least one of said main power terminals and said control terminal of their respective power die; an isolation coupler device for each of said control circuit semiconductor devices having isolated input and output terminals; said isolation coupler device output terminals connected to said input terminals of their respective control circuit semiconductor device; a local power supply for each of said control circuit semiconductor devices which is coupled between and energized by selected power terminals of said power semiconductor die; an insulation housing connected to said conductive heat sink and enclosing each of said power semiconductor die, said control circuit semiconductor devices, said isolation coupler devices and said local power supplies and their interconnections; a plurality of external power connection terminals fixed to the exterior surface of said insulation housing and electrically connected to said main power terminals of said power semiconductor die; and a plurality of external control terminals fixed to the exterior surface of said insulation housing and electrically connected to said input terminals of said isolation coupler devices.

4,965,711

SWITCHED CAPACITOR NETWORK

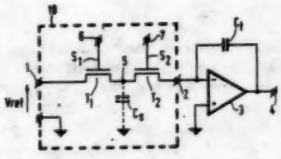
Petrus J. M. Kamp, and Arthur H. M. Van Roermund, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 288,845, Dec. 21, 1988, abandoned. This application Mar. 27, 1990, Ser. No. 501,399

Claims priority, application Netherlands, Dec. 29, 1987, 8703152

Int. Cl.[5] H02M *7/25;* H03F *1/32*

U.S. Cl. 363—60 **8 Claims**



1. A switched capacitor network, comprising an input terminal and an output terminal, a series arrangement of at least a first and a second successive switching transistor arranged between the input terminal and the output terminal, each switching transistor having a control electrode for receiving a switching signal, and a capacitance between the junction point of the first and the second switching transistor in the series arrangement and a point of constant potential, the control electrodes of the first and the second switching transistor being adapted to receive a first and a second switching signal, respectively, each of the two switching signals being in the form of a number of one or more successive pulses, which number is equal for both switching signals, the pulses of the first switching signal not overlapping those of the second switching signal with respect to time, and the frequencies of occurrence of the pulses in the two switching signals being substantially equal if said number of pulses is two or more, characterized in that the two successive first and second switching transistors in the series arrangement have a common semiconductor zone which comprises an active zone of each of said transistors and in that the capacitance consists solely of the parasitic capacitance of the common semiconductor zone.

4,965,712

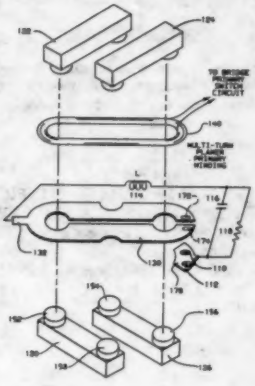
TRANSFORMER HAVING PLURAL-TURN CORE

Walter S. Duspiva, Port Ewen; John B. Gillett, Woodstock, and James H. Spreen, Stone Ridge, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 29, 1989, Ser. No. 226,340

Int. Cl.[5] H02M *7/06;* H01F *27/24, 27/30*

U.S. Cl. 363—126 **5 Claims**



1. A transformer comprising, in combination;

a core of magnetic material with four post segments and four link segments, arranged to form a single continuous flux path,

said segments arranged so that the flux path comprises, in order, a first post, a first link, a second post, a second link, a third post, a third link, a fourth post and a fourth link,

a secondary structure comprising a secondary conducting path,

said secondary conducting path being connected to an external circuit via two end terminals and a center tap terminal,

said secondary conducting path passing from the first of said end terminals, under said second link, over said first link, under said fourth link, and over said third link, to the second of said end terminals, thereby enclosing two of said four posts, and excluding the other two of said four posts,

said center tap terminal located on the said secondary conducting path between said second post and said fourth post,

a primary conducting path connected to an external circuit via two primary terminals, whereby currents in the turns of said primary conducting path additively produce flux in said single flux path.

4,965,713

TERMINAL ELEMENT

Ing-Tsann Hong, and Ernest C. Fitch, both of Stillwater, Okla., assignors to Viking Pump Inc., Cedar Falls, Iowa

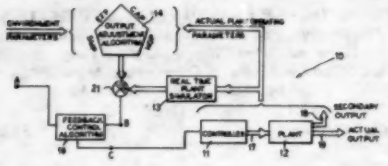
Filed Aug. 15, 1988, Ser. No. 231,960

Int. Cl.[5] G05B *13/04;* G01F *7/00;* F04B *49/00*

U.S. Cl. 364—149 **21 Claims**

1. Apparatus for generating a comparative plant output signal for a plant comprising, an output adjustment algorithm means which calculates the discrepancy made up of the real adjustments performed on the normal operating parameters, the enviornmental forcing parameters, the symptomatic monitoring parameters and the calibration adjustment parameters of

the system that exists between a theoretical real time plant simulator and the required signal to the control means for generating operating parameter signals, said theoretical real



time plant simulator receiving inputs from said means for generating operating parameter signals and an adder receiving the outputs of said real time plant simulator and said output adjustment algorithm means.

4,965,714

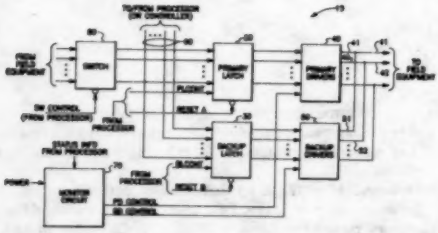
APPARATUS FOR PROVIDING CONFIGURABLE SAFE-STATE OUTPUTS IN A FAILURE MODE

Harry L. Knecht, Churchville, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 28, 1988, Ser. No. 263,843

Int. Cl.[5] G05B *23/02*; G06F *11/16*

U.S. Cl. 364—187 **8 Claims**



1. In a process control system, there is included a processor which outputs command signals to a plurality of field devices via an interface unit, said interface unit comprising:

(a) a primary output means, operatively connected to said processor, for storing a first set of said command signals received from said processor, to output said first set of command signals to said field devices in response to a first control signal, said first set of command signals being command signals for normal operation of the process control system; and

(b) secondary output means, operatively connected to said processor, for storing a second set of said command signals received from said processor, to output said second set of command signals to said field devices in response to a second control signal, and said second set of command signals being command signals for a failure mode of operation of the process control system, the second set of said command signals being temporarily stored by the secondary output means.

4,965,715

DATA FLOW TYPE INFORMATION PROCESSOR

Shinichi Yoshida, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 23, 1989, Ser. No. 299,610

Claims priority, application Japan, Jan. 23, 1988, 63-13452

Int. Cl.[5] G06F *13/00*

U.S. Cl. 364—200 **5 Claims**

1. A data flow type information processor for processing data in accordance with a data flow program, said data flow program containing a plurality of destination information, and a plurality of instruction information, and a plurality of priority information corresponding to the plurality of destination information, said data comprising a data packet which comprises a tag portion storing tag information containing at least designation information, an instruction fields storing instruction information, first and second data fields storing operand data, and an instruction information field storing priority information, comprising:

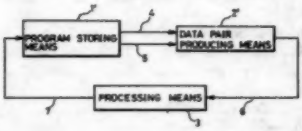
program storing means for storing said data flow program;

said program storing means reading out the destination information, the instruction information and the priority information from said data flow program in response to addressing based on the destination information in said tag of the inputted data packet, and storing the read information in the tag portion, the instruction field, and the priority information field of the data packet;

data pair producing means for detecting two data packets having the same tag information from data packets outputted from said program storing means and producing data pair;

said data pair producing means including matching memory having address space corresponding to hash address which is obtained by applying hash operation to said tag information in the data packet outputted from said program storing means;

said data pair producing means comparing the tag information in the inputted data packet with the tag information in the data packet read out from said matching memory in response to the designation of said hash address based on



the tag information in the inputted data packet, and if both tag information coincide with each other, storing the operand data stored in the first data field of one data packet, in the second data field of the other data packet and outputting the other data packet, and if both information do not coincide with each other, outputting the input data packet without processing, or exchanging the input data packet with the data packet in an area of the matching memory designated by said hash address and providing an output;

said data pair producing means being responsive to said priority information of the inputted data packet and the priority information of data packet read out from the matching memory to compare both priorities for processing of production of data pair in both data packets and being responsive to the result of comparison to perform processing such that data pair production processing is performed preferentially with respect to data packet having higher priority; and

operation processing means receiving the data packet outputted from said data pair producing means for providing a predetermined operation processing with respect to the received data packet;

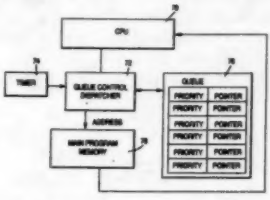
said operation processing means decoding instruction information in the instruction field of said data packet, applying a predetermined operation processing to the operand data in said first and second data fields, storing the processed result in one data field of the data packet, and providing the data packet to said program storing means.

4,965,716

FAST ACCESS PRIORITY QUEUE FOR MANAGING MULTIPLE MESSAGES AT A COMMUNICATIONS NODE OR MANAGING MULTIPLE PROGRAMS IN A MULTIPROGRAMMED DATA PROCESSOR

Michael A. Sweeney, Manassas, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 11, 1988, Ser. No. 167,265
Int. Cl.[5] G06F 7/06, 7/04
U.S. Cl. 364—200 3 Claims



1. In a communication node of a local area network comprising at least a processing means and a memory means a method for maintaining a priority queue for messages to be transmitted, comprising using said processing means for the steps of:

reading during a network contention interval, the contents of a holding register having a data portion related to a first message to be transmitted and a priority portion related to the priority of said first message, in response to a request for a highest priority message;

reading a top element from the top of an unsorted stack of elements stored in said memory means, each element of said stack containing a data portion related to a message to be transmitted and a priority portion related to the priority of the message, said top element being pointed to by a top of stack pointer, and writing the contents of said top element related to a second message to be transmitted, including a priority portion related to the priority of said second message, to said holding register;

searching during a period following said network contention interval, said plurality of elements in said unsorted stack by sequentially locating consecutively adjacent elements therein which are sequentially pointed to by a stack search pointer which is initially set equal to said top of stack pointer, and comparing the priority portion of an element pointed to by said stack search pointer, related to a third message to be transmitted, with said priority portion of the contents of said holding register;

swapping the contents of said element in said stack pointed to by said stack search pointer with the contents of said holding register, when the priority portion of said contents of said element related to said third message is greater than the priority portion of the contents of said holding register;

determining during said period following said network contention interval, if a new element is to be written into said stack, having a data portion related to a fourth message to be transmitted and a priority portion related to the priority of said fourth message;

comparing said new element to be written to said stack with the contents of said holding register to determine if the priority portion of said new element is greater than the priority portion of the contents of said holding register;

incrementing by unity the contents of said top of stack pointer and writing the contents of said holding register to a location is said stack now pointed to by said top of stack pointer when said priority portion of said new element is greater than the priority portion of the contents of said holding register, and further writing said new element to said holding register;

writing said new element to said stack when said priority portion of said new element is not greater than the priority portion of said contents of said holding register;

repeating said comparing of each element in said stack with the contents of said holding register until all said elements in said stack have been so compared;

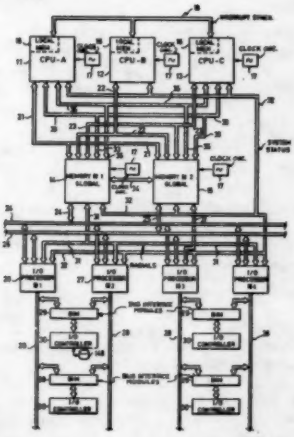
whereby stored date related to a message with the highest priority at said communication node, is accessible in said holding register.

4,965,717

MULTIPLE PROCESSOR SYSTEM HAVING SHARED MEMORY WITH PRIVATE-WRITE CAPABILITY

Richard W. Cutts, Jr., Georgetown; Nikhil A. Mehta, and Douglas E. Jewett, both of Austin, all of Tex., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Filed Dec. 13, 1988, Ser. No. 283,573
Int. Cl.[5] G06F 15/16
U.S. Cl. 364—200 20 Claims



1. A computer system comprising:

(a) multiple CPUs, a sequence of instructions executed separately by each one of said CPUs whereby the multiple CPUs are executing the same sequence of instructions,

(b) a common memory coupled to said CPUs and having memory space accessed by all said CPUs,

(c) a private memory space in said memory space of said common memory for storing state information for each CPU of said multiple CPUs, each said private memory space writable only by one CPU,

(d) said state information in each said private memory space for all of said multiple CPUs being readable by all of said multiple CPUs to thereby evaluate said state information for equality by each CPU.

4,965,718

DATA PROCESSING SYSTEM INCORPORATING A MEMORY RESIDENT DIRECTIVE FOR SYNCHRONIZING MULTIPLE TASKS AMONG PLURALITY OF PROCESSING ELEMENTS BY MONITORING ALTERNATION OF SEMAPHORE DATA

David A. George, Somers, and Bharat D. Rathi, Mahopac, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 29, 1988, Ser. No. 250,673
Int. Cl.[5] G06F 9/46, 11/30
U.S. Cl. 364—200 24 Claims

6. In a data processing system including a plurality of processing elements interconnected with each other and with at least one memory element by an interconnection means, each

of said processing elements selectively executing program tasks, said at least one memory element including multiple memory locations identifiable by corresponding memory addresses for storing data, a method for synchronizing operation of said plurality of processing elements, said method comprising the steps of:

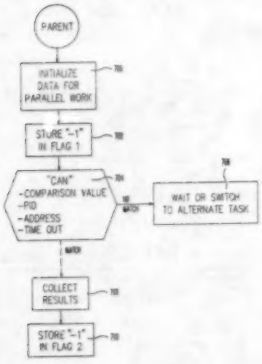
designating a selected memory location of a selected memory element to contain semaphore data;

altering, by selected ones of said plurality of processing elements, said semaphore data whereby to indicate a status of selected tasks;

sending, from at least one requesting processing element to said selected memory element via said interconnecting means, a directive including

(1) the address of said selected memory location,

(2) a comparison value, and



(3) an identification of the requesting processing element sending said directive;

reading in said selected memory element said semaphore data;

comparing in said memory element said semaphore data with said comparison value;

notifying said requesting processing element via said interconnection means if said semaphore data matches said comparison value;

storing said directive in said selected memory element if said semaphore data does not match said comparison value;

monitoring in said selected memory element the altering of said semaphore data; and

repeating said reading, comparing, and notifying steps when said semaphore data is altered.

4,965,719

METHOD FOR LOCK MANAGEMENT, PAGE COHERENCY, AND ASYNCHRONOUS WRITING OF CHANGED PAGES TO SHARED EXTERNAL STORE IN A DISTRIBUTED COMPUTING SYSTEM

Kurt A. Shoens, and Richard K. Treiber, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 16, 1988, Ser. No. 155,674

Int. Cl.[5] G06F *15/16, 13/00, 13/14*

U.S. Cl. 364—200 **4 Claims**

1. A method for managing the grant and release of locks requested by in-flight processes defined over multiple processors and associated shared external page storage and for maintaining coherency among copies of the same page,

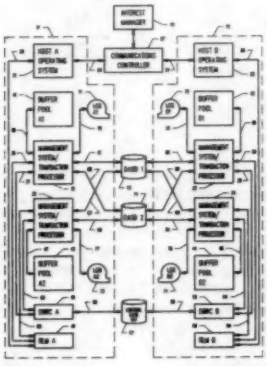
each processor including an internal memory, an operating system, and a lock manager, processes executing on respective processors generating read and write operations (ops), and said ops being presented to the local lock manager for obtaining either shared read locks or an update write lock to a designated page, said pages being either resident in processor internal memory or being copied into processor internal memory from the shared external storage, said local lock manager notifying other processor lock managers of the change in lock and page status,

comprising the steps of:

(a) responsive to a write ops generated by a process executing on a first processor,

(1) obtaining an update lock on a page designated by said write ops from the first processor lock manager, updating the designated page in the first processor internal memory, notifying all other lock managers by way of a message of the identity of the first processor and the updated page;

(2) responsive to notification acknowledgements received by the first processor from the other processor lock managers releasing the update lock, and the asynchronous writing of the updated page to external store; and



(b) responsive to a read ops generated by a process executing either on the first or on a second processor,

(3) obtaining a share lock from a page designated by the read ops from the counterpart first or second processor lock manager, ascertaining from any message accompanying the lock grant whether the page designated by said read ops is located in the internal memory of any processor; and

(4) either copying the designated page from the internal memory from the processor identified in the message or copying from shared external storage.

4,965,720

DIRECTED ADDRESS GENERATION FOR VIRTUAL-ADDRESS DATA PROCESSORS

Glen R. Mitchell, Pine Island; Richard G. Mustain, Rochester; Jon H. Peterson, Rochester, and Lawrence D. Whitley, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 221,004, Jul. 18, 1988, abandoned, which is a continuation of Ser. No. 610,366, May 15, 1984, abandoned. This application Aug. 8, 1989, Ser. No. 393,046

Int. Cl.[5] G06F *7/00, 9/00, 9/10*

U.S. Cl. 364—200 **4 Claims**

1. In a data processor, the combination comprising:

a memory having an address input for receiving a real address in a real address space;

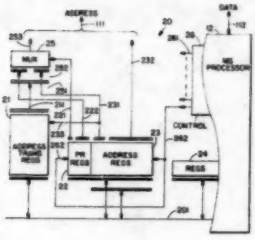
a common bus for transferring data to and from a plurality of registers;

address-register means coupled to said common bus for holding a virtual address capable of addressing a virtual address space substantially smaller than said real address

space, said virtual address having a segment portion and an offset portion;

a set of address-translation registers for converting said segment portion into a page portion of a real address, said page portion being substantially larger than said segment portion;

prefix-address register means coupled to said common bus for holding a partial direct-address specification having a control portion and a block portion;



switching means responsive to said prefix-address control portion for selectively coupling to a switching-means output either said address-translation registers or said prefix-address block portions along with a portion of said address-register means;

means for coupling to said address input a set of low-order bits comprising said offset portion of said register-address means catenated with a set of high-order bits comprising said switching-means output.

4,965,721

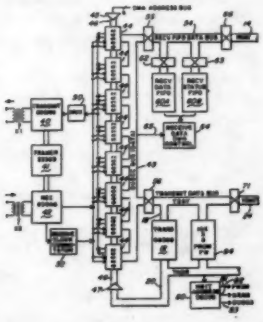
FIRMWARE STATE APPARATUS FOR CONTROLLING SEQUENCING OF PROCESSING INCLUDING TEST OPERATION IN MULTIPLE DATA LINES OF COMMUNICATION

Thomas O. Holtey, Newton, Mass.; Thomas L. Murray, Jr., Hollis, N.H.; Wayne A. Perzan, Holbrook, Mass., and Scott W. Smith, Hudson, N.H., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Mar. 31, 1987, Ser. No. 32,896

Int. Cl.[5] G06F *3/00, 13/12, 13/38, 11/28*

U.S. Cl. 364—200 **36 Claims**



1. A firmware state apparatus for controlling data transfer between a communication system having multiple independent data lines and a computer system, said apparatus comprising;

a transmit processor and a receive processor,

a processor memory coupled to said transmit processor and said receive processor and having a plurality of firmware instructions for performing data transfer between each of said lines of the communication system and the computer system, said instructions being divided into a plurality of groups that establish a corresponding number of predefined states so that a transition from one state to another state is executed within a period of time which is small in comparison to the amount of time for servicing all of said lines,

predetermined groups of instructions including at least one instruction defining a test operation for evaluating a condition related to one of said lines to control sequencing to a next one of the predefined states,

a shared memory having a plurality of locations for line table information for said lines,

said shared memory containing an address specifying a starting instruction of one of said groups of instructions,

one of said processors, in response to a group of instructions performing a designated operation, and in response to said instruction defining a test operation as a function of said condition, accessing in said shared memory a starting address of another group of instructions, and

control means for enabling conflict-free access to said shared memory by said transmit processor and said receive processor.

4,965,722

DYNAMIC MEMORY REFRESH CIRCUIT WITH A FLEXIBLE REFRESH DELAY DYNAMIC MEMORY

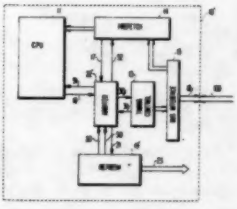
Takahiro Tokunme, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 228,880, Aug. 5, 1988, Pat. No. 4,924,381, which is a continuation of Ser. No. 743,549, Jun. 11, 1985. This application Nov. 27, 1989, Ser. No. 441,577

Claims priority, application Japan, Jun. 11, 1984, 59-119593; Nov. 15, 1984, 59-241002

Int. Cl.[5] G06F *1/00*

U.S. Cl. 364—200 **2 Claims**



1. A microprocessor coupled to a dynamic memory via an external bus, comprising an execution unit executing an instruction and generating a bus request signal to access said external bus when a data transmission is required in the execution of the instruction, a refresh timer for generating a refresh timing signal at predetermined time intervals, first means coupled to said refresh timer for generating a first refresh request signal in response to said refresh timing signal, second means coupled to said external bus for executing a refresh operation for said dynamic memory in response to a refresh grant signal supplied thereto, third means coupled to said second means for generating a refresh operation execution signal each time one refresh operation for said dynamic memory is executed, a counter coupled to said refresh timer and said third means for counting up a value thereof each time said refresh timing signal is generated and counting down the value thereof each time said refresh operation execution signal is generated, fourth means coupled to said counter for generating a second refresh request signal when the count value of said counter reaches a predetermined value, and a bus arbiter coupled to said execution unit and said first and fourth means for receiving said bus request signal and said first and second refresh request signals,

said bus arbiter disregarding said first refresh request signal when said bus request signal is supplied thereto, accepting said first refresh request signal when said bus request signal is absent to generate and supply said refresh grant signal to said second means, and responding to said second refresh request signal to generate and supply said refresh grant signal to said second means irrespective of the presence of said bus request signal, said second means performing said refresh operation for said dynamic memory at least once when said refresh grant signal is generated in response to said first refresh request signal and performing said refresh operation for said dynamic memory a plurality of times when said refresh grant signal is generated in response to said second refresh request signal.

4,965,723

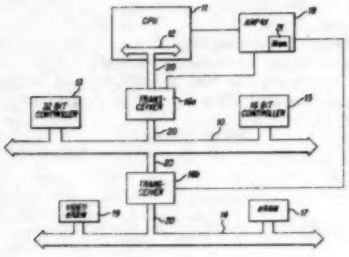
BUS DATA PATH CONTROL SCHEME

John Kirk, Boxboro, and Larry Narhi, Bolton, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 23, 1987, Ser. No. 111,642

Int. Cl.[5] G06F *13/36*

U.S. Cl. 364—200 **10 Claims**



1. A data path controller in a data processing system that includes a central processor unit and a plurality of subsystems, the controller providing for a transfer of data between subsystems having different data path widths, comprising:

a plurality of buses intercoupling the central processing unit and the plurality of subsystems, each bus having a data path width equal to or greater than a data path width of a subsystem having the greatest data path width, wherein at least two subsystems having differing data path widths are coupled to the same one of said plurality of buses; and

means for controlling a flow of data between subsystems over said plurality of buses, said means for controlling being coupled to said plurality of buses and comprising,

means for producing a control signal in response to a request to transfer data from a sending subsystem, which is coupled to one of the plurality of buses, to a receiving subsystem, which is coupled to one of the plurality of buses, and

means for controlling the data width of a flow of data between any two of said plurality of buses, said means for controlling the data width being responsive to said control signal so that data from said sending subsystem is transferred to said receiving subsystem, wherein said means for controlling the data width is coupled between any two of said plurality of buses and receiving the control signal from said means for producing a control signal.

4,965,724

COMPILER SYSTEM USING REORDERING OF MICROOPERATIONS TO ELIMINATE INTERLOCKED INSTRUCTIONS FOR PIPELINED PROCESSING OF ASSEMBLER SOURCE PROGRAM

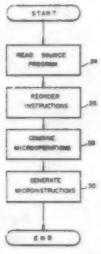
Isao Utsumi, and Yoshikazu Mori, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 29, 1988, Ser. No. 162,225

Claims priority, application Japan, Mar. 5, 1987, 62-48960; Aug. 17, 1987, 62-203175

Int. Cl.[5] G06F *9/22, 9/30, 9/42, 9/45*

U.S. Cl. 364—200 **2 Claims**



1. A method of compiling a source program described with assembler instructions, each of which defines a plurality of microoperations, into a target program for use in a pipeline processor operative with microcodes forming a horizontal type of instructions defined by the microoperations, comprising the steps of:

(a) reading the source program and generating intermediate codes representative of the assembler instructions;

(b) identifying basic blocks of the intermediate codes of the assembler instructions and determining whether or not any basic block forms a loop, each basic block having a respective head portion and tail portion, and calculating a Du-chain for the basic blocks;

(c) transferring either of the head and tail portions of a basic block forming a loop, if any, to the remaining one of the head and tail portions of the basic block forming the loop, the portion to be transferred being determined on the basis of a live parameter, included in the basic block immediately following the basic block forming the loop, resulting from the calculated Du-chain;

(d) reordering microoperations of said source program by determining whether or not two of the assembler instructions are interlocked with each other, and placing another of the assembler instructions which is independent of the interlocked assembler instructions between the interlocked assembler instructions, if any; and

(e) combining the microoperations reordered in said reordering step so as not to conflict with each other on fields of the assembler instructions and resources used by the assembler instructions.

4,965,725

NEURAL NETWORK BASED AUTOMATED CYTOLOGICAL SPECIMEN CLASSIFICATION SYSTEM AND METHOD

Mark R. Rutenberg, Monsey, N.Y., assignor to Neuromedical Systems, Inc., Monsey, N.Y.

Filed Apr. 8, 1988, Ser. No. 179,060

Int. Cl.[5] G06F *15/18, 15/42, 15/70*; G06K *9/62*

U.S. Cl. 364—413.1 **43 Claims**

1. An automated cytological specimen classifier for classify-

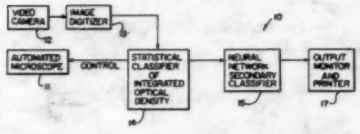
ing cells contained in a smear on a slide to identify cells that are likely to be malignant or pre-malignant, comprising:

(a) microscope means for obtaining a vie of at least part of a cytological specimen including cells and other material located generally randomly on a slide in an arrangement which can include other than a single layer of cells,

(b) camera means for creating an image of such view,

(c) image digitizing means for producing a digital representation of such image,

(d) a primary classifier means for detecting objects in a digital representation of a cytological specimen based on a detectable feature, said primary classifier means comprising a classifier means for detecting cells that are likely to be malignant or pre-malignant as well as other cells and



material that initially appear to have characteristics of a malignant cell or a pre-malignant cell based on integrated optical density, and

(e) a secondary classifier for distinguishing pre-malignant and malignant cells form other cells and material among the objects detected by the primary classifier, said secondary classifier means comprising a neural computer apparatus means for effecting such distinguishing as a function of training thereof.

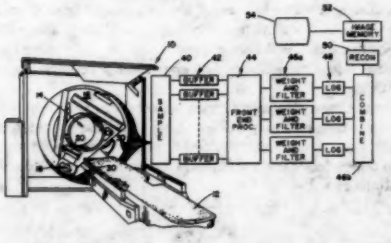
19. A method of classifying cytological specimens, comprising using a primary classifier apparatus primarily classifying a specimen which is generally randomly arranged and can include other than in a single layer to determine locations of interest, and secondarily classifying such locations of interest using a neural network computer apparatus.

4,965,726

CT SCANNER WITH SEGMENTED DETECTOR ARRAY

Dominic J. Heuscher, Aurora, and Rodney A. Mattson, Mentor, both of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Filed Oct. 20, 1988, Ser. No. 260,403
Int. Cl.[5] G06F *15/42*
U.S. Cl. 364—413.19 **20 Claims**



1. A transmission CT scanner comprising:

a means for defining an examination region;

a radiation source means for rotating a beam of radiation about the examination region;

a plurality of segmented arrays of radiation sensitive cells for receiving radiation which has transversed the examination region from the source means and for producing electrical signals indicative of the received radiation, each segmented array including:

a common substrate,

a regular two dimensional grid of solid state radiation sensitive cells formed on the common substrate, the grid having a plurality of rows of radiation sensitive cells in a peripheral direction generally parallel to a circumference of the examination region and a plurality of rows of cells along a longitudinal direction; and,

an image reconstruction means for reconstructing the electrical signals into an image representation.

10. A method of medical diagnostic imaging comprising:

rotating a fan beam of radiation around an object to be imaged;

detecting radiation which has traversed the object with a plurality of segmented arrays, each of the arrays having a two dimensional grid of radiation sensitive cells;

serially reading radiation absorption data from radiation sensitive cells of each array;

combining data from a plurality of cells; and,

reconstructing a transverse image representation from the combined, serially read data.

14. A CT scanner comprising:

a means for defining an examination region;

a plurality of segmented arrays mounted in a peripheral ring around the examination region, each array including a common substrate on which a two dimensional array of solid state radiation sensitive cells are deposited, each cell receiving radiation from the examination region and producing electrical signals indicative of said received radiation;

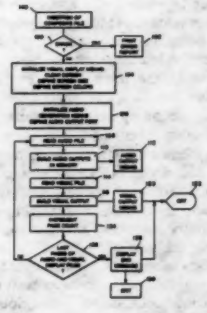
an array of at least one of (a) transistors and (b) charged coupled devices deposited on the common substrate for serially connecting the radiation sensitive cells to output amplifiers, which output amplifiers are also disposed on the common substrate.

4,965,727

COMPUTER CARD

John D. Halamka, 237 Rose Ave., Mill Valley, Calif. 94141

Filed Sep. 13, 1984, Ser. No. 649,995
Int. Cl.[5] G06G *15/38*
U.S. Cl. 364—419 **10 Claims**



1. In combination in a system for processing and supervising a plurality of composit interpersonal-social communication selections each comprising a visual display and an audio display, each of said interpersonal-social communicaiton selections displayable by visual and audio output means, said system including data file means for storing information characterizing each composite interpersonal-social communication selection, manual entry means for entering information characterizing each composite interpersonal-social communication selection, data receiving and display means for receiving and dis-

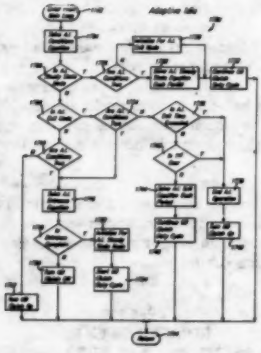
playing said information from said manual entry means, means responsive to said data file means and said data receiving and displaying means for generating an update to said data file means, means responsive to said stored information whereby said visual display is generated synchronously with the generation of said audio display on said output means.

4,965,728

METHOD OF ADAPTIVELY IDLING AN ELECTRONIC AUTOMATIC TRANSMISSION SYSTEM

Maurice B. Leising, Clawson; Howard L. Benford, Bloomfield Hills; Michael R. Lindsay, Livonia, and Jay C. McCombie, Rochester Hills, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 29, 1988, Ser. No. 188,617
Int. Cl.[5] B60K 41/02; F16H 5/58
U.S. Cl. 364—424.1 14 Claims



14. In a vehicle having an engine and a transmission system including an input member, an output member, a torque converter assembly for transmitting torque between an engine and the input member, a gear assembly for changing the ratio of torque between the input member and output member, a plurality of friction elements for shifting the gear assembly, a fluid actuating device being movable axially for applying at least one friction element, at least one solenoid-actuated valve being moved in response to the presence or absence of electrical power to the valve for directing fluid flow between a fluid source and the fluid actuating device, sensors providing signals indicative of measurement data for predetermined conditions, a controller with memory for processing and storing the signals and predetermined values and providing output signals to control the solenoid-actuated valves, a method of placing a vehicle transmission in a neutral operating mode when the vehicle is substantially stationary and the engine is idling, said method comprising the step of:

reading a plurality of sensors by the controller to determine whether the transmission can be placed in a substantially neutral operating mode when the engine of the vehicle is idling;

checking the difference between the speed of the engine and the turbine to determine whether the transmission is in a steady state mode of the substantially neutral operating mode;

determining whether the transmission is exiting the substantially neutral operating mode if the transmission is not in a steady state mode;

determining whether predetermined conditions for placing the transmission in the substantially neutral operating mode are true if the transmission is in the steady mode;

actuating the piston to engage fully a clutch assembly to place the transmission in a first gear operating mode if the predetermined conditions are not true;

solving a predetermined equation to place the transmission in a substantially neutral gear operating mode if the predetermined conditions a true;

determining whether the transmission has been placed in the substantially neutral operation mode; and

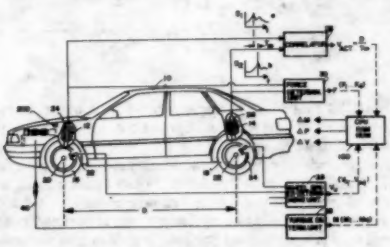
disengaging the clutch assembly fully if the transmission has been placed in the substantially neutral operating mode.

4,965,729

METHOD AND APPARATUS FOR IMPROVING THE OPERATIONAL CHARACTERISTICS OF A VEHICLE

Hans W. Häfner, Aichach-Walchshofen, Fed. Rep. of Germany, assignor to Pfister GmbH, Augsburg, Fed. Rep. of Germany

Filed Jun. 9, 1988, Ser. No. 204,328
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1987, 3719320
Int. Cl.[5] B60T 8/32; G06F 15/50
U.S. Cl. 364—426.03 19 Claims



1. A method for improving the operational characteristics of a vehicle provided with wheels arranged behind each other in a moving direction of the vehicle comprising the steps of:

determining a first speed of movement of the vehicle dependent on the rotary speed of at least one of said wheels;

sensing first oscillations at a first position of said vehicle, caused by said vehicle passing over unevennesses of a road during movement;

sensing second oscillations at a second position of said vehicle located at a fixed distance behind said first position in said moving direction, caused by said unevennesses of said road;

correlating said first and second oscillations for determining a time delay therebetween;

calculating a second speed of the movement of said vehicle from said fixed distance between said first and second positions and said time delay;

setting said first and second speeds into relation to each other;

determining a slippage of said wheel from said relation by comparing said first and second speeds of said vehicle; and

controlling a momentary speed of movement of said vehicle in dependence on said slippage exceeding a predetermined slippage value.

4,965,730

VEHICLE-RUNNING CONTROL SYSTEM

Kazumasa Kurihara, and Kenji Arai, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

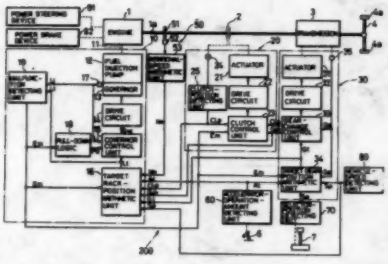
Filed Oct. 20, 1988, Ser. No. 260,392
Claims priority, application Japan, Oct. 30, 1987, 62-273455
Int. Cl.[5] G05D 29/00; F02D 33/00; B60K 28/10
U.S. Cl. 364—431.09 3 Claims

1. A system for controlling running of a vehicle which includes an engine, a clutch coupled to said engine, said clutch being capable of occupying an engaged position and a disengaged position, a transmission coupled to said clutch, said transmission being capable of selecting a plurality of gear

positions including a neutral position, shaft means drivingly connected to said transmission, wheel means mounted on said shaft means for rotation therewith, and vehicle maneuvering means employing power produced due to rotation of said engine, said system comprising:

(a) an engine-combustion control device including malfunction detecting means for detecting a malfunction of said engine combustion control device, and engine-combustion stopping means for stopping combustion in said engine in response to a malfunction detecting signal from said malfunction detecting means;

(b) a clutch control device including normal clutch control means for outputting a control signal representative of said engaged and disengaged positions of said clutch, and an actuator for actuating said clutch on the basis of a control signal from said normal clutch control means wherein said clutch control device has emergency clutch



switching means which is operative in response to the malfunction detecting signal from said malfunction detecting means to output a control signal to said actuator of said clutch control device for bringing said clutch to said engage position; and

(c) a transmission control device including normal transmission control means for determining a gear position of said transmission to output a control signal, and an actuator for changing the gear position of said transmission on the basis of said control signal from said normal transmission control means, wherein said transmission control device has emergency gear-position switching means which is operative in response to the malfunction detecting signal from said malfunction detecting means to output a control signal to said actuator of said transmission control device for bringing said gear position to one different from said neutral position.

4,965,731

SYSTEM AND METHOD OF SPECIFIC FLIGHT JET AIRCRAFT OPERATION

Paul G. Weltz, Jr., Cornwall, Vt., assignor to Simmonds Precision Products, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 901,096, Aug. 27, 1986, abandoned. This application Sep. 22, 1988, Ser. No. 247,480

Int. Cl.[5] G01N *25/30*

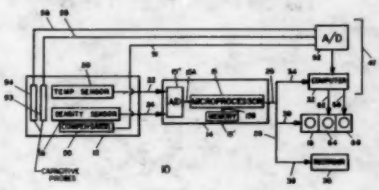
U.S. Cl. 364—442 **13 Claims**

8. In a method of operating a jet aircraft on a specific flight, said jet aircraft supporting at least one fuel tank, and determining an amount of a selected liquid aircraft fuel having an actual heating value required to make said flight and to be loaded into said tank, the improvement comprising:

providing signal processing means, said signal processing means comprising a memory, said memory being adapted to store data relating to actual density and actual heating value for a plurality of liquid aircraft fuels, said signal processing means being adapted to use said data to determine an actual amount of said selected fuel required for said flight,

determining the density and temperature of said fuel,

determining the actual heating value of said fuel using the temperature and density of said fuel, and



loading at least said actual amount of said selected liquid aircraft fuel required for said flight into said fuel tank, said actual amount of said selected liquid aircraft fuel required for said flight being less than an amount of liquid fuel having a lower heating value required for said flight.

4,965,732

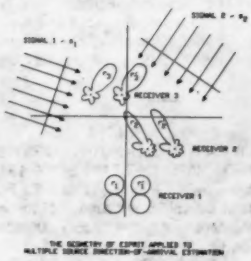
METHODS AND ARRANGEMENTS FOR SIGNAL RECEPTION AND PARAMETER ESTIMATION

Richard H. Roy, III, Cupertino, Calif.; Arogyaswami J. Paulraj, Bangalore, India, and Thomas Kailath, Stanford, Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 795,623, Nov. 6, 1985, Pat. No. 4,750,147. This application Nov. 2, 1987, Ser. No. 116,094

Int. Cl.[5] G01S *13/68*

U.S. Cl. 364—460 **7 Claims**



1. A method of detecting multiple signal sources and estimating parameters thereof comprising the following steps:

(a) providing an array of at least one group of a plurality of signal sensor pairs, the sensors in each pair being identical and the displacement between sensors of each pair in a group being equal, thereby defining two subarrays (X and Y),

(b) obtaining signal measurements with the sensor array so configured,

(c) processing said signal measurements from said two subarrays (X and Y) to identify the number of sources and estimate parameters thereof, including identifying eigenvalues from which source number and parameter estimates are based,

(d) solving the signal copy problem and determining array response (direction) vectors using the generalized eigenvectors, and

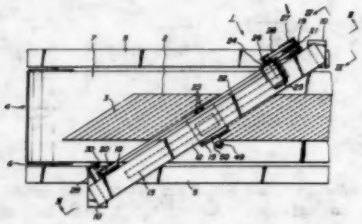
(e) estimating the array geometry from the said array response vectors.

4,965,733

CUTTING APPARATUS FOR SHEET-LIKE MATERIALS

Hidetoshi Kimura, and Hiroki Toya, both of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jan. 18, 1989, Ser. No. 298,146
Claims priority, application Japan, Jan. 18, 1988, 63-6788
Int. Cl.[5] B26D *1/18*; B29D *30/46*
U.S. Cl. 364—474.09 10 Claims



1. A cutting apparatus for sheet-like materials comprising: traveling means having a traveling support member movable above a sheet-like material, cutting means hanging from said traveling support member of the traveling means and movable in directions perpendicular to traveling directions of the traveling support member, first detecting means for detecting positions of said cutting means in the traveling directions of the traveling support member, second detecting means for detecting positions of said cutting means in directions perpendicular to said traveling directions of the traveling support member, and arithmetic means including a signal converter and a digital arithmetic unit for obtaining a cut line of said sheetlike material obtained from the positions of said cutting means on co-ordinates with the aid of signals detected by said first and second detecting means, and further obtaining an approximate straight line of said cut line and an angle of the straight line deviating from a predetermined line along which said cutting means is to be moved.

4,965,734

VENEER LATHE CHARGING METHOD FOR DETERMINING LOG SPIN AXIS

Paul O. Edwards, Sweet Home; William E. Bolton; Larry C. Hunter, both of Corvallis, and Amos A. Horner, Cascadia, all of Oreg., assignors to Applied Theory, Division of U.S.N.R., Inc., Corvalis, Oreg.

Continuation of Ser. No. 294,948, Jan. 6, 1989, abandoned, which is a continuation of Ser. No. 150,510, Feb. 9, 1988, abandoned, which is a continuation of Ser. No. 211,590, Dec. 1, 1980, abandoned, which is a division of Ser. No. 925,521, Jul. 17, 1978, Pat. No. 4,246,940, which is a continuation-in-part of Ser. No. 772,010, Feb. 25, 1977, abandoned. This application Nov. 13, 1989, Ser. No. 436,113
Int. Cl.[5] G06F *15/46*; B27L *5/02*
U.S. Cl. 364—474.09 7 Claims

1. A method for determining an optimal spin axis of a log and for delivering the log to the chucks of a veneer lathe comprising:

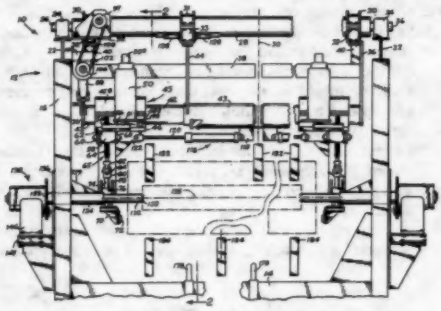
feeding the log into a veneer lathe charging apparatus;

analyzing the log's cross-sectional profile by scanning preselected cross-sectional peripheries of the log at locations along the length thereof, including directing optical beams across the log's surface for locating points at convex portions of each periphery;

developing a mathematical model of lines tangent to the points about each periphery, the lines tangent defining n-sided irregular polygons about each periphery;

computing the largest cylinder together with its cylindrical axis which will fit within the confines of each of said irregular polygons along the length of the log, including computing a cylinder which will have a portion of its volume lying outside of the log's surface;

recognizing the cylindrical axis as an optimal spin axis; and



loading the log into the chucks of a veneer lathe in such a manner that the optimal spin axis corresponds to the axis around which the veneer lathe will spin the log.

4,965,735

METHOD OF DETERMINING THE SHIFT LEVER POSITION OF AN ELECTRONIC AUTOMATIC TRANSMISSION SYSTEM

Gerald L. Holbrook, Rochester Hills, and Maurice B. Leising, Clawson, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 29, 1988, Ser. No. 188,615
Int. Cl.[5] B60K *41/04*
U.S. Cl. 364—424.1 8 Claims

1. In a vehicle having an engine and a transmission including an input member, an output member, a gear assembly for changing the ratio of torque between the input member and output member, a plurality of friction elements for shifting the gear assembly, sensors providing signals indicative of measurement data for predetermined conditions, a controller having memory for processing and storing the signals and predetermined values and providing signals to control the friction elements, at least one sensor sensing the position of a manually operated shift lever to select between a plurality of predetermined operating modes the transmission such as park, reverse, neutral, overdrive, drive and low (PRNODDL) and temporary intermediate positions and providing a code (PC) of each predetermined operating mode, a method of identifying a plurality of operating modes of the transmission and allowing operation of the transmission with temporary or invalid PC by utilizing fluid pressure and speed sensor data, said method comprising the steps of:

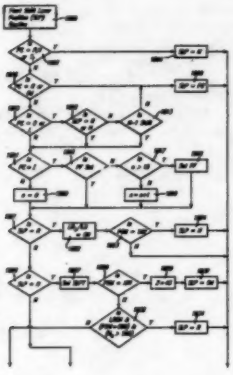
generating a PC by a plurality of sensors indicative of the shift lever position;

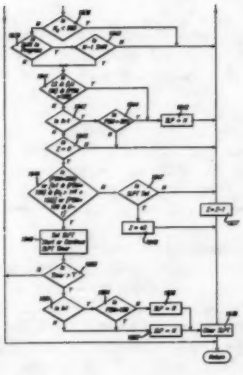
setting the current shift lever position by the controller equal to PC when PC equals at least one of a plurality of predetermined PC codes and conditions exist;

otherwise, checking the fluid pressure by the controller of at least one of a plurality of pressure sensors associated with predetermined friction elements and checking speed relationships by the controller of at least one of a plurality of speed sensors to identify the predetermined mode of operation of the transmission;

identifying the predetermined mode of operation of the transmission without PC and setting the current shift lever

position equal to the identified predetermined mode of operation of the transmission; and





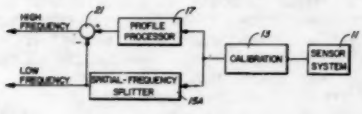
controlling the transmission using the current shift lever position.

4,965,736

CROSS-DIRECTIONAL CONTROL OF SHEETMAKING SYSTEMS

Ramesh Balakrishnan, Stanford, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Filed Jun. 15, 1988, Ser. No. 207,412
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—469 **24 Claims**



1. A system for controlling cross-directional sheet properties during production of sheets on sheet processing machines, comprising:

measurement means for providing measurements of at least one property of a sheet during production, which measurements are made at a plurality of cross-directional locations that successively span the sheet;

means for assembling the measurements to provide cross-directional profiles of the sheet;

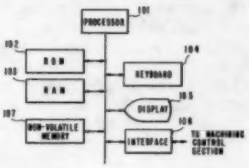
spatial-frequency splitting means for operating upon the cross-directional profile measurements to separate selected spatial-frequency components from each cross-directional profile to provide operating signals to cross-directional control devices based upon the separated spatial-frequencies.

4,965,737

NUMERICAL CONTROL APPARATUS PROVIDING HIGH-SPEED DISTRIBUTION DATA

Takashi Iwagaya, Hachioji, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP87/00545, § 371 Date Jan. 29, 1988, § 102(e) Date Jan. 29, 1988, PCT Pub. No. WO88/01072, PCT Pub. Date Feb. 11, 1988
PCT Filed Jul. 25, 1987, Ser. No. 167,851
Claims priority, application Japan, Jul. 26, 1986, 61-175866
Int. Cl.[5] G05B *19/403*
U.S. Cl. 364—474.22 **5 Claims**



1. A numerical control apparatus for controlling a machine tool having a machining function for movement of a tool relative to a workpiece along a rotational axis of the workpiece to machine the workpiece to a predetermined shape, comprising:

data setting means for setting a relation between a rotational angle of the workpiece and a position of the tool relative to the workpiece;

processing means for deciding an amount of tool movement and a rotational velocity of the workpiece in accordance with the relation; and

drive control means for distributing at high-speed decided move command data to said machine tool.

4,965,738

INTELLIGENT BATTERY SYSTEM

George W. Bauer, Windermere, Fla., and Thomas J. Sokira, Cheshire, Conn., assignors to Anton/Bauer, Inc., Shelton, Conn.

Filed May 3, 1988, Ser. No. 189,958
Int. Cl.[5] G01R *19/00*; H02J *7/04*
U.S. Cl. 364—483 **18 Claims**

1. A battery system comprising a battery pack, said battery pack including:

a plurality of battery cells;

positive and negative terminals serially coupled to said battery cells, said positive terminal delivering output current to a load and receiving input current in the direction of charging current;

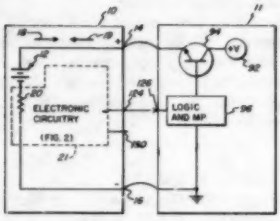
sensing means for sensing current and data pulses flowing through said battery cells and said positive and negative terminals;

an output port outputting data from said battery pack;

memory means for storing battery parameter data; and

electronic means, coupled to the sensing means and said

memory means, for transmitting said battery parameter data to said output port in response to said sensing means



sensing said current input through said positive terminal in the direction of charging current.

4,965,739

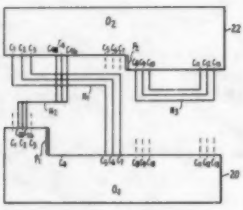
MACHINE PROCESS FOR ROUTING INTERCONNECTIONS FROM ONE MODULE TO ANOTHER MODULE AND FOR POSITIONING SAID TWO MODULES AFTER SAID MODULES ARE INTERCONNECTED

Charles H. Ng, Sunnyvale, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Continuation of Ser. No. 31,061, Mar. 26, 1987, abandoned. This application Aug. 7, 1989, Ser. No. 390,420

Int. Cl.[5] G06F *15/60*

U.S. Cl. 364—491 **9 Claims**



1. A machine process for positioning two modules on a planar field by the use of a programmed digital computer having stored therein a program, said program for creating representations of said modules in said computer, said representations are separated by a region defined by a plurality of substantially parallel columns from a representation of one module (hereinafter: "one representation") to a representation of the other module (hereinafter: "other representation") and by a plurality of substantially parallel tracks having variable widths substantially perpendicular to said columns, said representations of the modules are connected by a plurality of interconnections; a portion of each of said interconnection lies on a column and on a track, said program enabling the computer to perform the following steps:

(a) moving a track, having a first width closest to said one representation to said one representation by moving each point in said track, intersected by a column, to as close to said one representation as possible such that said track moved has a first profile;

(b) establishing a guard frame for said track moved in step (a);

(c) repeating the steps of (a) and (b) by moving the track next furthest away from the last track, having a second width different from said first width moved in the direction of said other representation; and

(d) moving said other representation in a direction to said one representation to as close to the last track moved as possible;

wherein said modules are placed in positions of said representations.

4,965,740

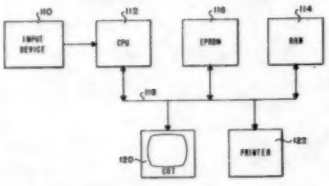
APPARATUS AND METHOD FOR SELECTING AND POSITIONING TRUSS CONNECTOR PLATES

Paul J. Schofield, Thatcham, England, and Leo A. Goheen, Bedford, Tex., assignors to Truswall Systems Corporation, Arlington, Tex.

Filed Dec. 30, 1988, Ser. No. 292,419

Int. Cl.[5] H04N *7/18*

U.S. Cl. 364—512 **17 Claims**



12. In a data processing system, an apparatus for determining respective areas of overlap of a connector plate on individual wood members of a corresponding truss joint, said apparatus comprising:

data processing means;

input means coupled to said processing means for entering selected truss parameters into the system;

memory means coupled to said processing means for storing said selected truss parameters, said memory means having a predetermined set of program instructions stored therein; and

said data processing means being responsive to said truss parameters for determining the respective areas of overlap of the plate on the respective wood members according to said program instructions by the following steps:

defining a predetermined reference point on the joint;

representing each wood member as a corresponding two-dimensional polygon, each side of which is defined by a corresponding member vector, each of said member vectors having starting and ending points relative to the reference point;

representing the connector plate as a rectangle of predetermined dimensions, each side of said rectangle being defined by a corresponding one of a plurality of plate vectors, each of said plate vectors having starting and ending points relative to the reference point; and

determining respective areas of intersection of the rectangle with the respective polygons represented by the wood members, said areas of intersection representing the respective areas of overlap of the connector plate on the respective wood members.

4,965,741

METHOD FOR PROVIDING AN IMPROVED HUMAN USER INTERFACE TO A KNOWLEDGE BASED SYSTEM

Michael A. Winchell, and Robin L. Steele, both of Fort Collins, Colo. 80526, assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 17, 1988, Ser. No. 258,961

Int. Cl.[5] G06F *15/00, 15/20*; G09C *15/00*

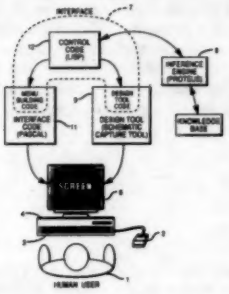
U.S. Cl. 364—513 **3 Claims**

1. An improved process for interfacing a human with knowledge based integrated circuit design system, in which a computer aided design system is capable of executing schematic capture and an expert system is capable of analyzing the schematic to identify design deficiencies, wherein the improvement comprises:

electronically extracting advice information from the expert system;

electronically inserting into an advice directory a cross-reference to said extracted advice, the extracted advice text, and the extracted advice schematic location information;

storing the advice directory in a file by advice key words;



building an advice menu suitable to select extracted advice information by said key words;

building a command menu suitable to manipulate computer aided design system schematic information; and

displaying in response to selection by the human user both schematic information and advice information in correspondence with the location of the schematic information.

4,965,742

PROCESS CONTROL SYSTEM WITH ON-LINE RECONFIGURABLE MODULES

Richard D. Skeirik, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 30, 1987, Ser. No. 103,047
Int. Cl.[5] G06F *15/18*
U.S. Cl. 364—513 **64 Claims**

1. A computer-based method for operating a substantially continuous process, comprising the steps of:

(1) operating the process with one or more sensors connected to sense conditions in materials being processed, and one or more actuators connected to change conditions in the process;

(2) controlling one or more of said actuators with a process controller in accordance with signals received from said sensors and in accordance with one or more control parameters;

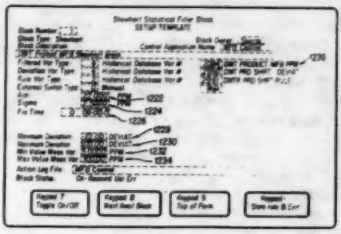
(3) running a process supervisor procedure comprising one or more software modules, for selectively defining one or more of said control parameters for said process controller;

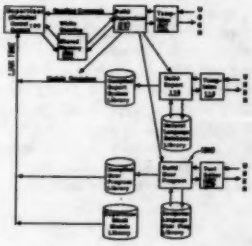
(4) selectively presenting a functional structure to a user, for a new software module for said process supervisor procedure and/or a functional structure corresponding to the user input from which a current software module of said process supervisor procedure was generated, and selectively loading the user input from said functional structure to be used by said process supervisor procedure;

wherein step (4) of presenting a functional structure includes presenting standardized data interface definitions further comprising the step (5) of enabling each said software module to perform the steps of

getting data from any one of a plurality of data collection and/or process control systems

and/or sending process control parameters to any one of a plurality of data collection and/or process controls systems





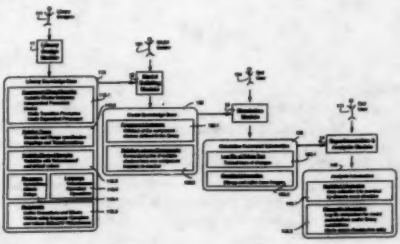
without the user explicitly defining any custom data interfacing procedures.

4,965,743

DISCRETE EVENT SIMULATION TOOL FOR ANALYSIS OF QUALITATIVE MODELS OF CONTINUOUS PROCESSING SYSTEM

Jane T. Malin, Houston; Bryan D. Basham, Seabrook, and Richard A. Harris, Houston, all of Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 14, 1988, Ser. No. 219,295
Int. Cl.[5] G06F *15/18*
U.S. Cl. 364—513 **25 Claims**



1. A method for off-line experiments and analyses of an application specific system of components using qualitative modeling and discrete event simulation to analyze dynamic system effects of changes in components with continuous behavior, including malfunction, comprising the steps of:

providing a library knowledge base of domain specific modeling elements which includes components with modes,

mode transition, variables, and behavior descriptions, a qualitative algebra for defining and combining component variables, and relations to link the components, constructed relative to the application specific system,

providing a model knowledge base for the application specific system, which includes component instances, each with a current mode, linked by relation instances,

providing change control mechanisms, independent and distinct from the domain specific modeling elements, to select and control effects of changes within the model knowledge base, to control a time-ordered simulation,

inputting data, which may include malfunction data, to effect changes in the component instances within the model knowledge base, either by changing a variable value of a component instance or by changing the current mode of a component instance,

updating variable values and the current mode of component instances, and propagating changes through the model knowledge base in a time-ordered fashion in response to the input data and resulting changes, under control of the change control mechanisms,

and outputting information in response to the changes in variable values and the current mode of component instances and to the propagation of changes through the model knowledge base, to support analysis of effects of changes which may include malfunctions, on modes of component instances, and to support analysis of diagnostic experiments in which effects of malfunctions on the system are compared.

4,965,744

APPARATUS FOR ERASING AND EXTRACTING IMAGE DATA FROM PARTICULAR REGION OF ORIGNAL DOCUMENT

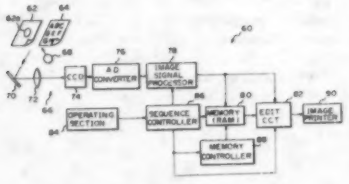
Yuki Wagatsuma, Shibata, and Hiroshi Kanno, Shiroishi, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 167,314

Claims priority, application Japan, Mar. 13, 1987, 62-58204; Mar. 13, 1987, 62-58205

Int. Cl.[5] G06F *15/66*; H04N *1/38*

U.S. Cl. 364—518 **7 Claims**



3. An apparatus for reading an image of a mark provided on a marking sheet which marks a desired region of a document printed on an original document and producing data associated with the image of said mark, reading said document image of said original document, storing data associated with the image of said mark in a memory, and applying image processing to said document image, in a predetermined editing mode and a predetermined image mode, said apparatus comprising:

an AD (analog-to-digital) converting means for reading said image of said mark of said marking sheet and said document image and converting respective resulting image data into respective digital image data;

image signal processor means for processing said digital image data in said predetermined image mode to transform said digital image data into two-level pixel data and writing said pixel data in said memory;

sequence controller means for determining if it is said document image or said image of said marking sheet that has been read by said scanner, and commanding said image signal processor means to process said digital image data in a selected image mode; and

editing means, supplied with said pixel data associated with said image of said marking sheet and read out of said memory and said pixel data associated with said document image and outputted by said image signal processor means, for applying image processing to said document image in said predetermined editing mode;

wherein said image mode comprises a text mode for applying MTF (modulation transfer function) processing to said digital image data to slice said image data at a predetermined threshold value, and a graphic mode for subjecting said digital image data to halftone processing.

4,965,745

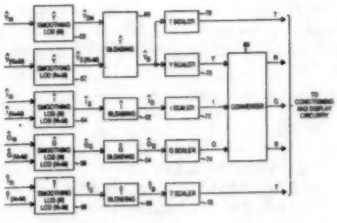
YIQ BASED COLOR CELL TEXTURE

Richard Economy; Walter R. Steiner, and Richard G. Fadden, Jr., all of Ormond Beach, Fla., assignors to General Electric Company, Syracuse, N.Y.

Filed Dec. 18, 1987, Ser. No. 135,059

Int. Cl.[5] G06F *15/66*

U.S. Cl. 364—518 **12 Claims**



12. In a computer image generation system, apparatus for generating color characteristics for an object of a scene to be displayed, comprising:

first scaler means for scaling first color information of the object expressed at a first predetermined bit resolution to provide second color information of the object expressed at a second predetermined bit resolution, wherein the second predetermined bit resolution is less than the first predetermined bit resolution;

processing means having an input coupled to the first scaler means for receiving the second color information, the processor means for determining third color information of the object expressed at the second bit resolution; and

scaler means coupled to the processing means for receiving the third color information, the second scaler means for generating fourth color information of the object expressed at the first bit resolution in response to the third color information, wherein the fourth color information is representative of the color of the object to be displayed wherein the first color information is expressed by luminance (Y), in-phase (I) chroma and quadrature (Q) chroma components and further wherein the apparatus includes storage means having an output coupled to the first scaling means for providing the first color information to the first scaling means, the storage means for storing the Y component at a first level of detail and for storing each of the corresponding I and Q components at a second level of detail, wherein the first level of detail is greater than the second level of detail.

4,965,746
RECURSIVE-TYPE PERIODIC TEMPORAL SIGNAL GENERATOR

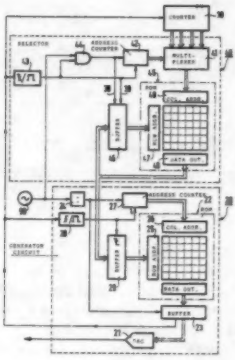
Alain Le Mehauté, Gif Sur Yvette; Jean-Francois Quiniou, Besancon; Claude Roques-Carmes, Besancon; Dalloul Wehbi, Bentancon, and Antoine Derossis, Marcoussis, all of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed Dec. 20, 1988, Ser. No. 286,819

Claims priority, application France, Dec. 21, 1987, 87 17810

Int. Cl.[5] G06F *1/025*; H03K *3/64*

U.S. Cl. 364—518 **3 Claims**



1. A recursive periodic temporal signal generator wherein the periodic configuration pattern is defined by an arrangement of seed patterns (a_0, b_0, . . .) of m different types (a, b, . . .), wherein m is an integer greater than one, resulting from a recursive construction employing n successive applications of m recurrent pattern type composition laws defined by arrangements of p pattern elements, where p is an integer greater than one, said recursive construction consisting in defining the periodic configuration pattern as one of the components of the nth terms Un with m components (a_n, b_n, . . .), one per pattern type, of a recurrent sequence, said nth term Un being defined at the level of its components (a_n, b_n, . . .) according to the components (a_{n-1}, b_{n-1}, . . .) of the preceding term U_{n-1} by the m recurrent pattern type composition laws and the initial term U_0 of the sequence having for its components the seed patterns (a_0, b_0, . . .), said generator comprising means for breaking down the periodic configuration pattern into a sequence of seed patterns (a_0, b_0, . . .) and means (**20**) for generating signal forms corresponding to the various seed patterns appearing in the sequence and being characterized in that said means for breaking down the periodic configuration pattern comprises:

counting means (**30**) to base p which are incremented when the seed patterns change in the breakdown of the periodic configuration pattern and which delivers an n-digit number, and

pattern type selector means (**40**) addressed by the counting means (**30**) to base p.

4,965,747
IMAGE FORMING APPARATUS

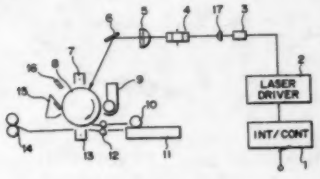
Yasumasa Ohtsuka, Yokohama; Hiroto Hasegawa, Kawasaki, and Koichi Tanigawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1989, Ser. No. 347,923

Claims priority, application Japan, May 10, 1988, 63-111644; May 10, 1988, 63-111645

Int. Cl.[5] G06F *9/00*

U.S. Cl. 364—519 **58 Claims**



1. An image forming apparatus comprising:

image forming means for forming a visible image in correspondence with output information;

bit map memory means for storing said output information;

recognition means for recognizing the stroke width of said output information stored in said bit map memory means; and

control means for controlling said image forming means in correspondence with the recognition output from said recognition means.

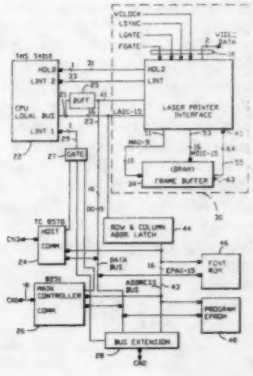
4,965,748
LASER PRINTER CONTROLLER FLEXIBLE FRAME BUFFER ARCHITECTURE WHICH ALLOWS OFFSETTING DIFFERENT INPUT/OUTPUT DATA WIDTHS

Hershow Chang, Los Altos; Seong Kim, Saratoga, and Tetsuro Motoyama, San Jose, all of Calif., assignors to Ricoh Company, Ltd., Tokyo, Japan and Ricoh Corporation, San Jose, Calif.

Filed Jul. 12, 1989, Ser. No. 379,020

Int. Cl.[5] G06F *15/00*

U.S. Cl. 364—519 **10 Claims**



1. A laser printer controller system comprising

a laser printer for printing data on a document,

frame buffer memory means for providing variable digital data width data bus to said laser printer wherein said

video data corresponds to the data to be printed on said document,

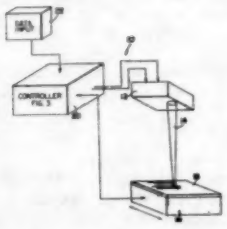
control means having a certain data width data bus for controlling said variable data widths, wherein said variable data width is at least twice the width of said certain data width, said control means further including shift register means for interfacing to said laser printer.

4,965,749

METHOD AND APPARATUS PROVIDING SKIP LINE ASYNCHRONOUS IMAGING

Ronald J. Strasyer, South Windsor, Conn., assignor to The Gerber Scientific Instrument Company, South Windsor, Conn.

Filed Jun. 30, 1989, Ser. No. 374,252
Int. Cl.[5] G01D *9/42*
U.S. Cl. 364—520 **13 Claims**



1. A control apparatus for use in a laser raster scanner that, in response to input data signals, scans an exposure beam across a substrate mounted on a movable write platen in a sequence of scan lines by means of an exposure beam generator that includes a multi-faceted rotating mirror, said control apparatus comprising:

a computation means for receiving said input data signals and for generating exposure signals therefrom grouped in sequential arrays each of which is associated with a selected one of the scan lines, said computation means further generating signals for advancing the write platen from a current position corresponding to the current scan line to successive positions corresponding to successive scan lines, each of said exposure signal arrays corresponding to a modulated exposure beam presented to a one of the mirror facets as said facet rotates from a first position to a second position respectively corresponding to the beginning and the end of a scan line;

a buffer for receiving a signal array for the next scan line;

a detector means for providing signals indicative of said mirror facet rotational position; and

a sensor for generating signals indicative of the exposure signals received by said buffer;

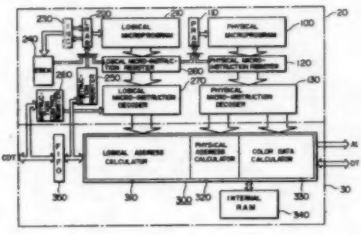
said computation means recursively determining from said sensor signals and detector means signals indicative of said mirror position when the current mirror facet is in said first position and providing control signals to the exposure beam generator for disabling the presentation of said next scan line signal array and for altering the write platen motion if all of the exposure signals corresponding to said next scan line have not been received by said buffer.

4,965,750

GRAPHIC PROCESSOR SUITABLE FOR GRAPHIC DATA TRANSFER AND CONVERSION PROCESSES

Shigeru Matsuo, Hitachi; Koyo Katsura, Hitachiota; Jun Sato, Musashino; Takashi Sone, Tokyo, and Masakatu Yokoyama, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Hitachi, both of, Japan

Filed Mar. 30, 1988, Ser. No. 175,418
Claims priority, application Japan, Mar. 31, 1987, 62-78195; May 15, 1987, 62-116870; Jul. 10, 1987, 62-171032
Int. Cl.[5] G06F *15/62*
U.S. Cl. 364—521 **3 Claims**



3. A graphic processor which stores information of pixels each expressed in multiple bits and transfers data from a transfer source area to a transfer destination area by implementing data conversion, said processor comprising:

first means for storing transfer source coordinates;

second means for storing intermediate points in the interval of transfer source coordinates through division into an integral number n in both X and Y directions;

third means for storing transfer destination coordinates;

fourth means for reading color data out of the transfer destination coordinates and converting the color data into binary data under a predetermined condition; and

fifth means for reading out pixels at four points surrounding said intermediate coordinates, supplying the read out four pixel points to said fourth means and storing information in a table as to which of the four pixel points is to be transferred in accordance with the binary data information from said fourth means and intermediate coordinates provided by said second means.

4,965,751

GRAPHICS SYSTEM WITH PROGRAMMABLE TILE SIZE AND MULTIPLEXED PIXEL DATA AND PARTIAL PIXEL ADDRESSES BASED ON TILE SIZE

Larry J. Thayer, and Mark D. Coleman, both of Ft. Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 18, 1987, Ser. No. 87,172
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—521 **8 Claims**

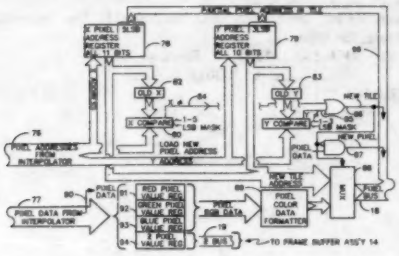
1. A graphics system for storing pixel data values into addressable pixel locations of a frame buffer from whence an image can be displayed, the graphics system comprising:

rendering means for computing pixel addresses corresponding to cartesian coordinates of physical locations of individual pixels upon a display and for computing pixel values describing an image to be displayed; and

tile definition means, coupled to the pixel addresses and to the pixel values, for defining tiles composed of bounded regions containing contiguous pixel locations, and for producing at an output having less than the number of signal lines needed to simultaneously transmit a complete pixel address and an associated pixel value and coupled to a frame buffer:

(a) the complete pixel address in alternation with its asso-

ciated pixel value when the pixel lies within a different tile than that which contained the preceding pixel; and



(b) a subset of the pixel address concurrently with its associated pixel value when the pixel is within the boundaries of the same tile that contained the preceding pixel.

4,965,752

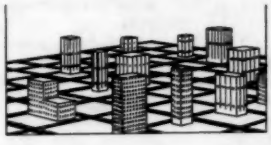
SPATIAL TRANSFORMATION OF NODE POINTS IN COMPUTER GRAPHICS USING VECTOR DIFFERENCES BETWEEN THEIR SPATIAL COORDINATES

Michael Keith, Bucks County, Pa., assignor to Intel Corporation, Santa Clara, Calif.

Filed Apr. 24, 1987, Ser. No. 41,942

Int. Cl.[5] G06K *9/32*

U.S. Cl. 364—522 **5 Claims**



1. A method for moving an image having a plurality of television image samples with original locations along a path in a three-dimensional image space, said method comprising:

determining a path through said image samples defined by difference vectors connecting successive samples along said path;

spatially transforming the original location in said image space of one of said plurality of samples that is the starting sample along said path;

spatially transforming said difference vectors;

spatially transforming the location of samples along a path of locations by proceeding from the transformed location of the starting sample and sequentially performing a single vector addition of a single spatially transformed difference vector at each location, to successively generate the spatially transformed locations of each of the samples only by said single vector addition of said single spatially transformed difference vector; and

moving the image from an original image location to a transformed image location in accordance with the spatially transformed locations.

4,965,753

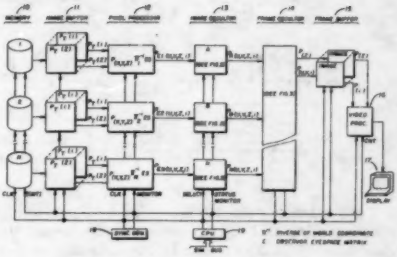
SYSTEM FOR CONSTRUCTING IMAGES IN 3-DIMENSION FROM DIGITAL DATA TO DISPLAY A CHANGING SCENE IN REAL TIME IN COMPUTER IMAGE GENERATORS

Werner Kraemer, Binghamton, N.Y., assignor to CAE-Link Corporation, Link Flight, Binghamton, N.Y.

Continuation of Ser. No. 283,041, Dec. 6, 1988, abandoned. This application Feb. 23, 1990, Ser. No. 485,861

Int. Cl.[5] G06F *15/72*

U.S. Cl. 364—522 **8 Claims**



1. A three-dimensional computer image generation system for constructing images from digital data to display a scene in real-time as viewed from a moving eyepoint, comprising:

at least two pipeline circuit means to process image objects as viewed from at least two different eyepoint locations;

each of said pipeline circuit means comprising:

digital data storage means including input means to receive pixel brightness data and pixel distance data; and

pixel processing means to transform pixel data received from said storage means to a characteristic for each pixel as viewed from a changing eyepoint location;

frame occulting circuit means having an input to receive the transformed pixel data from each pipeline circuit means to determine priority between different image data at different distances for the same scene pixel and outputting the determined priority; and

frame buffer storage means connected to the output of said frame occulting circuit means to retain temporarily a frame of processed scene data while the immediate past frame is being displayed.

4,965,754

IMAGE PROCESSING

Peter W. Stansfield, Hertfordshire, and Alastair Reed, Leighton Buzzard, both of England, assignors to Crosfield Electronics Limited, London, England

Filed Apr. 1, 1988, Ser. No. 176,588

Claims priority, application United Kingdom, Apr. 3, 1987, 8708010

Int. Cl.[5] G06F *15/20*

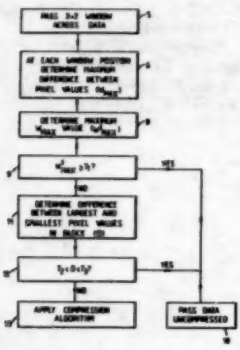
U.S. Cl. 364—526 **8 Claims**

1. A method of processing digital data representing the colour content of abutting blocks of pixels defining an image, the method comprising, for each said block

(i) applying a predetermined algorithm to digital data defining the color content of pixels in said block to determine a measure of the variation in colour content of pixels in said block;

(ii) if the measure lies within a predetermined range, applying a compression algorithm to said digital data defining said block to provide compressed digital data, and feeding

said compressed digital data to one of a store and a transmission circuit; and



(iii) if the measure does not lie within said predetermined range, feeding said digital data as uncompressed digital data to one of said store and said transmission circuit,

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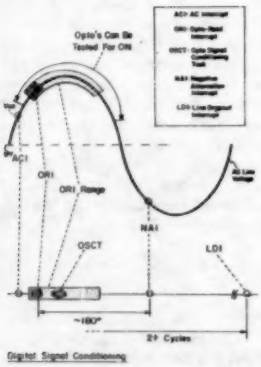
4,965,755

METHOD AND APPARATUS FOR MONITORING AC INPUT SIGNALS

Paul B. Patton, Edgewood, and Kenneth B. Kidder, Coon Rapids, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 27, 1989, Ser. No. 303,595
Int. Cl.[5] G06F 7/00
U.S. Cl. 364—550 15 Claims



1. A method for monitoring a plurality of AC input signals to a control system, comprising the steps of:

generating an AC interrupt signal, based on an AC system signal which is substantially phase-synchronous with the AC input signals, for an interrupt time period corresponding to a time period when the AC system signal exceeds a predetermined threshold voltage;

checking the AC interrupt signal to verify that the AC system signal exceeds the predetermined threshold voltage;

setting a timer for a pseudo-random time value upon verification of the AC interrupt signal; and

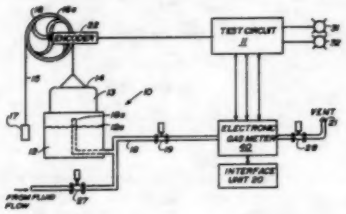
sampling the AC input signals when the timer has reached the pseudo-random time value to determine the presence or absence of the AC input signals.

4,965,756

METHOD AND APPARATUS FOR CALIBRATION OF ELECTRONIC GAS METERS

Arthur N. J. Pearman, St Paul, and Michael A. Woessner, Golden Valley, both of Minn., assignors to Gas Research Institute, Chicago, Ill.

Filed Oct. 11, 1988, Ser. No. 225,770
Int. Cl.[5] G01F 25/00
U.S. Cl. 364—571.01 17 Claims



1. A method for calibration of a fluid flow meter and the like, comprising:

supplying a gaseous test fluid to the meter under test in a series of different known flow rates;

measuring the volume flow rate of the test fluid supplied to the meter and the time taken at each flow rate using a volume measurement standard apparatus and a timing means;

enabling the meter under test to measure the volume flow rate of the fluid which flows through the meter at each test flow rate and recording the volume flow rate measured by the meter at each test flow rate; and

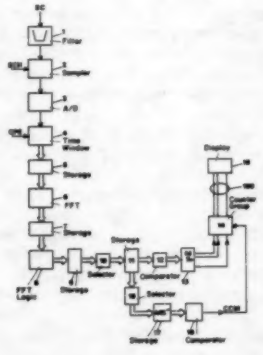
deriving from the recorded and measured fluid flow rates obtained for each test flow rate, data for use in the calibration of the meter.

4,965,757

PROCESS AND DEVICE FOR DECODING A CODE SIGNAL

Francis Grassart, Chapelle-Lez-Herlaimont, Belgium, assignor to ACEC, Societe Anonyme, Brussels, Belgium

Continuation of Ser. No. 138,275, Dec. 28, 1987, abandoned.
This application Jul. 31, 1989, Ser. No. 388,312
Claims priority, application European Pat. Off., Dec. 30, 1986, 86870201.0
Int. Cl.[5] G01R 23/16; G06F 15/332
U.S. Cl. 364—576 18 Claims



1. A process for decoding received coded signals (SC) produced by modulation of a carrier current at a predetermined

rate and for recognizing a code signal among a plurality of possible code signals, comprising the steps of:

sampling the received coded signals at a sampling frequency, converting amplitudes of temporal samples in successive blocks of samples of specified length into corresponding digital values,

transforming the digital values into a frequency domain by means of a fast Fourier transform to produce and store a set of digital FFT spectral data representing measured frequencies of the transform;

comparing the digital FFT spectral data representing the measured frequencies with stored theoretical frequency spectra for the possible code signals and generating therefrom a set of information items (M1–Mn) called "conversions", the values of the conversions representing differences between the measured frequencies and theoretical frequencies for each of the possible code signals;

for each of the possible code signals selecting from the set of stored "conversions", the conversion which has a greatest correspondence to that possible code signal and storing these conversions (Ms_1–MS_N) as a set of particular conversions;

from the set of stored particular conversions (MS_1–MS_N), selecting and storing that one conversion which has a greatest spectral correspondence (MSo) indicating a corresponding with one of the possible codes;

generating in response to the selected conversion (MSo), a signal message (MSC), which identifies the received code signal (SC), this signaling message (MSC) activating a display device.

4,965,758

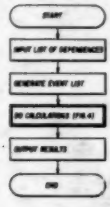
AIDING THE DESIGN OF AN OPERATION HAVING TIMING INTERACTIONS BY OPERATING A COMPUTER SYSTEM

Steven K. Sherman, Marlboro, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 1, 1988, Ser. No. 162,624

Int. Cl.[5] G06F *15/60*

U.S. Cl. 364—578 **7 Claims**



1. A method to aid in the design of an operation having timing interactions, by operating a computer system including a processor, a memory, a means for entering data and a display, the method comprising the steps of:

(a) generating with said processor a dependence list data structure from a set D of dependence information entered into the memory, the dependence information describing timing relationships between first and second events of each dependence of the operation and describing each dependence as a primary dependence or secondary dependence;

(b) generating an event list data structure in the memory from the dependence list data structure, said events identified in one or more of said primary class dependences being primary events and said events identified in no primary class dependence being secondary events, said set D including related dependences which are isomorphic with a single graph G having edges connecting vertexes, the vertexes of G corresponding to events named in the events list data structure and the edges of G corresponding to the dependences in the dependence list data structure;

(c) searching the dependence list and locating a first primary dependence to serve as a root dependence for a tree;

(d) forming a primary event nucleus by selecting and attaching additional primary dependences to said tree;

(e) adding secondary dependences in layers around the primary event nucleus of said tree;

(f) assigning a time attribute to events in said tree, said time attributes being consistent with the timing relationships specified in the set D of dependence information;

(g) repeating steps (d), (e) and (f) to develop a time consistent graph T having all the vertexes of graph G and with edges corresponding to dependences in a set I of included dependences, I being a subset of G, a dependence being in I if its interval corresponds to the difference in time attributes of its two vertexes, the set I of included dependences and the time attributes being subject to the conditions that:

(1) the number of primary class dependences from the set D included in I be maximized;

(2) all primary vertexes be connected by a set C of core linkage dependences, set C being a subset of I, the number of secondary dependences in the core linkage set C being minimized;

(3) each secondary vertex S_j be connected to a primary vertex by a set P_j of peripheral-linkage secondary dependences, set P_j being a subset of I, the number of secondary dependences in each peripheral-linkage set P_j being minimized;

(4) subject to the above conditions in (1), (2) and (3), the number of secondary class dependences in I be maximized;

(h) providing design information from the time consistent graph T on the display means; and

(i) applying the design information to aid in the design of said operation.

4,965,759

SPREAD-SPECTRUM RECEIVER

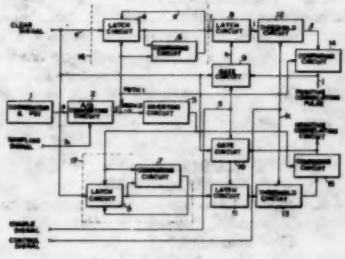
Yoshitaka Uchida; Masahiro Hamatsu, and Masaharu Mori, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jan. 6, 1989, Ser. No. 294,773

Claims priority, application Japan, Jan. 14, 1988, 63-007141; Jan. 14, 1988, 63-007142; Jan. 14, 1988, 63-007143

Int. Cl.[5] H04J *13/00*; H04B *15/00*; H04L *27/10, 27/06*

U.S. Cl. 364—604 **10 Claims**



1. A spread-spectrum receiver, comprising correlator means for correlating a received signal with a reference signal to obtain a correlation spike, and pulse generating means for generating a correlation pulse in response to the correlation spike, said pulse generating means including:

analog to digital converter means responsive to a periodic sampling signal for converting a peak value of each said correlation spike from an analog from into a digital form;

first peak hold means for holding a digital peak value from

said converter means, said first peak hold means comparing the peak value therein with a subsequent digital peak value from said converter means and thereafter holding the subsequent peak value when the comparison shows that the subsequent peak value is larger;

second peak hold means responsive to a periodic enable signal for accepting and holding the peak value present in said first peak hold means;

threshold setting means responsive to the peak value held in said second peak hold means for determining a threshold value;

comparator means for comparing digital peak values from said converter means with said threshold value and for generating a correlation pulse if a peak value from said converter means exceeds said threshold value; and

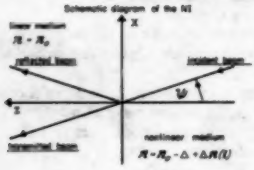
means for periodically generating a clear signal which clears said peak value in said first peak hold means.

4,965,760

SATURATED OPTICAL INTERACTION GATE

Robert R. Cuykendall, and Karlheinz Strobl, both of Iowa City, Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

Filed Apr. 21, 1989, Ser. No. 341,696
Int. Cl.[5] G06F 7/56
U.S. Cl. 364—713 **38 Claims**



1. An optical interaction gate comprising:

a nonlinear interface including a first material having an index of refraction and a second material having a nonlinear index of refraction, said second material having an index of refraction equal to or greater than that of the first material for low intensities, and said first material and said second material being disposed in intimate contact with each other; and

means for selectively generating and directing two distinguishable beams of approximately equal intensity upon said nonlinear interface such that when said beams have a first higher total intensity said beams reflect from said nonlinear interface and when said beams have a second lower total intensity said beams pass through said nonlinear interface.

4,965,761

FAST DISCRETE FOURIER TRANSFORM APPARATUS AND METHOD

Richard S. Schlunt, Loma Linda, Calif., assignor to General Dynamics Corporation, Pomona Div., Pomona, Calif.

Filed Jun. 3, 1988, Ser. No. 201,814
Int. Cl.[5] G06F 15/332
U.S. Cl. 364—726 **5 Claims**

1. Apparatus for computing the discrete Fourier transform of a sequence X(0), X(1), . . . , X(N-1) of sampled electromagnetic signals comprising:

first multiplier means accepting said sequence as an input and having an output;

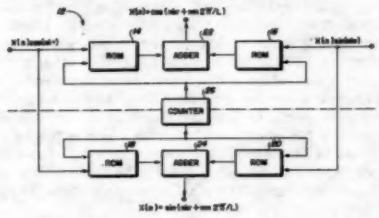
second multiplier means accepting said sequence as an input and having an output;

a cosine read-only memory (ROM) communicating with said first multiplier means;

a sine read-only memory communicating with said second multiplier means;

a plurality of module means, each having a first input connected to the output of said first multiplier means, and having a second input connected to the output of said second multiplier means; each said module means also having first and second outputs;

first accumulator means having a first input connected to the output of said first multiplier means and a second input



connected to the output of said second multiplier means; and

a plurality of additional accumulator means identical to said first accumulator means, each said additional accumulator means having first and second inputs connected to said first and second outputs of a corresponding module means;

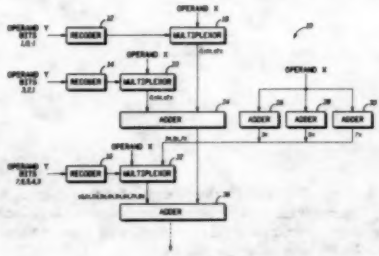
each said accumulator means having first and second outputs which are the real and imaginary parts of one component of said discrete Fourier transform.

4,965,762

MIXED SIZE RADIX RECODED MULTIPLIER

Tim A. Williams, Austin, Tex., assignor to Motorola Inc., Schaumburg, Ill.

Filed Sep. 15, 1989, Ser. No. 407,828
Int. Cl.[5] G06F 7/52
U.S. Cl. 364—760 **15 Claims**



1. A multiplier using at least two of a plurality of predetermined recoding algorithms and providing a product of first and second input operands, said multiplier recoding a predetermined one of the input operands by using at least two sets of bits of predetermined differing set size to group the predetermined input operand into a plurality of groups of bits, each group of bits having a bit size corresponding to one of first or second set sizes, said multiplier forming special product terms by creating integer multiples of the first operand, said special product terms being required by the multiplier to form partial product terms by using bits associated with the second set size and also forming at least one partial product term by using bits associated with the first set size, said first and second set sizes

having differing integer values, said partial product terms being added to provide the product.

4,965,763

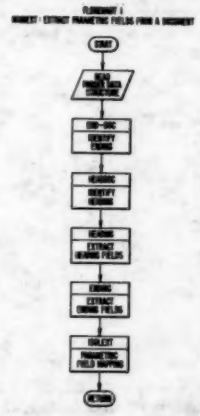
COMPUTER METHOD FOR AUTOMATIC EXTRACTION OF COMMONLY SPECIFIED INFORMATION FROM BUSINESS CORRESPONDENCE

Elena M. Zamora, Chevy Chase, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 21,078, Mar. 3, 1987, abandoned. This application Feb. 6, 1989, Ser. No. 308,955

Int. Cl.[5] G06F *15/40*

U.S. Cl. 364—900 **2 Claims**



1. A computer method for the automatic extraction of commonly specified information from a business correspondence document, such as date of letter, name of recipient, name of sender, address of sender, title of sender, carbon copy list, subject statement, and the like, comprising the steps of:

a first scanning step of scanning the input data stream to locate postscripts, attachments of appendices at a first location by matching each word from the input data stream against a list of expressions used to indicate postscripts, attachments of appendices, said first location being set equal to the final occurring line in said data stream if said first scanning step does not locate any postscripts, attachments or appendices therein, said first location alternately being set equal to a location of postscripts, attachments or appendices found in said first scanning step;

a second scanning step of scanning the input data stream to locate the final sentence in said document, starting from said first location and scanning toward the beginning of said data stream, searching for words which are verbs in the final sentence in said document, by identifying the last occurrence of a verb in the input data stream, which will occur in the final sentence of said document;

a first identifying step of identifying an ending portion of the document expected to contain a sender's name, return address, title of carbon copy list information, at a location in the input data stream occurring after the end of said final sentence located in said second scanning step, and occurring before said first location located in said first scanning step;

a third scanning step of scanning said input data stream to locate any salutation by matching each word from the input data stream against a list of natural language expressions that can be used as a salutation;

a second identifying step of identifying a beginning portion of the document at a location which includes a portion from the start of the input data stream to the end of a salutation, if a salutation was located in said third scanning step;

a fourth scanning step of scanning the input data stream if no salutation was found in said third scanning step, said fourth scanning step to locate date, addressee, sender, return address, personal title or subject information in the input data stream by matching each word of the input data stream against a list of expressions that are used to indicate the date, addressee, the sender, the return address, personal title and the subject of the correspondence document;

a third identifying step of identifying, if no salutation was found in said third scanning step, a beginning portion of the document at a location which includes the date, addressee, sender, return address, personal title or subject information of the correspondence document located in said fourth scanning step;

isolating and storing from said beginning portion of said document, any addressee, sender, return address, personal title or subject information therein;

isolating and storing from said ending portion of said document, any sender, return address, title or carbon copy list information therein.

4,965,764

MEMORY ACCESS CONTROL SYSTEM

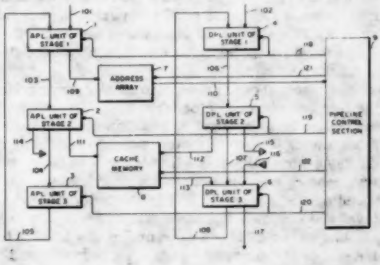
Fumio Aono, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 3, 1988, Ser. No. 168,888

Claims priority, application Japan, Mar. 4, 1987, 62-47701; Mar. 4, 1987, 62-47702; Mar. 4, 1987, 62-47704

Int. Cl.[5] G06F *12/00*

U.S. Cl. 364—900 **8 Claims**



1. A memory access control system coupled to requester units and a main memory, and processing memory access requests from said requester units, comprising:

pipeline control means providing instructions for achieving pipeline control for successive processing of memory addresses and data;

plural stages of pipeline unit means for selectively storing and reading out said addresses and said data in response to said instructions from said pipeline control means;

input means for providing said addresses and data to at least one stage of said pipeline unit means in response to said memory access requests;

cyclic address coupling means for so coupling, from among said plural stages of said pipeline unit means, those particular stages of said pipeline unit means relating to particular address as to cause said particular addresses to circulate in response to said pipeline control; and

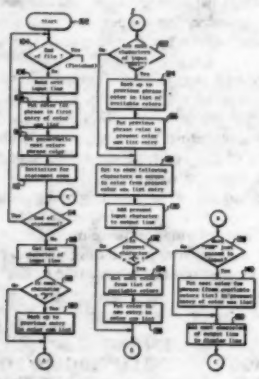
cyclic data coupling means for so coupling, from among said plural stages of said pipeline unit means, those particular stages of said pipeline unit means relating to particular data as to cause said particular data to circulate in response to said pipeline control.

4,965,765

DISTINGUISHING NESTED STRUCTURES BY COLOR

Max R. Brown, Arlington, Tex., assignor to International Business Machines Corp., Armonk, N.Y.

Filed May 16, 1986, Ser. No. 864,175
Int. Cl.[5] G06F 3/153
U.S. Cl. 364—900 3 Claims



1. In a computer system for analyzing the logic of multiple levels of nested computing expressions, procedures, statements and other structures of information in programming languages, said computer system having color display means for displaying text of a computer program in a programming language, the method of performing a nesting analysis of the computer program as each statement of the program is prepared for display on said display means comprising the steps of:

storing in said computer system a color table of color codes in a fixed sequence;

displaying the text of a first level in a color corresponding to the first code in said color table;

as each new level of logic is found in said computer program, saving in said computer system a color code used to display a current level in a first-in/last-out table, this table representing a list of incomplete logic levels;

suspending the display of text in the color of said current level and commencing the display of text in a color according to said fixed sequence until a new level of logic or the end of the current level of logic is found; and

resuming the display of text in the color of the previous, lower entry code in said first-in/last-out table when the end of the current level of logic is found.

4,965,766

DIGITAL INPUT/OUT CIRCUIT CAPABLE OF SENDING AND RECEIVING DATA IN DIFFERENT MODES

Tetsuyuki Fukushima, and Satoru Kobayashi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 25, 1988, Ser. No. 198,351
Claims priority, application Japan, May 25, 1987, 62-128915
Int. Cl.[5] G06F 13/00
U.S. Cl. 364—900 7 Claims

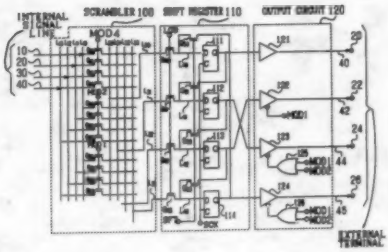
1. A digital input/output circuit to be connected between a data bus composed of 2^n signal lines (n is zero or a positive integer) and 2^n external terminals and including an output port for outputting data from said data bus to the external terminals and an input port for inputting the data from the external terminals to said data bus, wherein

said output port comprises

scrambler means receiving data of 2^n bits from said data bus and a mode signal designating a data transmission bit pattern from a mode signal source and operating for relocating bit positions of received data in accordance with said mode signal so as to output the relocated data with each data unit of 2^m bits (m is an integer not greater than n) indicated in a data transmission bit pattern designated by said mode signal,

output circuit means including 2^n output buffers each having an input connected to receive an output of said scrambler means and an output connected to a corresponding one of said external terminals, said output circuit means operating in response to said mode signal so as to make active 2^m output buffers of said 2^n output buffers in accordance with said mode signal and to make the other output buffers inactive, and

data shift means connected to said scrambler means and including data latch means for latching data outputted from said scrambler means and shifting the latched data in accordance with said mode signal so that the data of



2^n bits is outputted with said each data unit of 2^m bits through said active output buffers, and

said input port comprises

input circuit means having 2^n input buffers connected in their inputs to said external terminals, respectively,

data shift means including data latch means for receiving the data outputted from said input circuit means so as to latch the data of at least 2^m bits in said data latch means in accordance with said mode signal, said data shift means operating to shift the latched data between said data latch means in accordance with said mode signal, and

scrambler means connected to said data shift means so as to allow data of 2^n bits relocated in a bit position in accordance with said mode signal to be outputted to said data bus.

4,965,767

ASSOCIATIVE MEMORY HAVING SIMPLIFIED MEMORY CELL CIRCUITRY

Mitsuya Kinoshita; Masaaki Mihara; Toshifumi Kobayashi, and Takeshi Hamamoto, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1989, Ser. No. 380,428
Claims priority, application Japan, Jan. 13, 1989, 1-6832
Int. Cl.[5] G11C 15/00
U.S. Cl. 365—49 9 Claims

8. An associative memory including at least one memory cell which can be accessed for reading, writing and coincidence detection, said associative memory comprising:

first and second bit lines connected to said memory cell,

a word line connected to said memory cell,

command means for generating a command signal for commanding said coincidence detection,

a command line connected between said command means and said memory cells for transmitting said command signal generated by said command means to said memory cell, and

a coincidence detection line connected to said memory cell

for outputting from said memory cells a signal showing the results of coincidence detection,

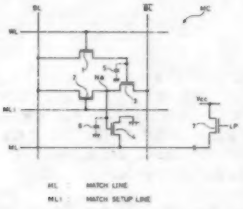
said memory cell including

first and second field effect transistors of one conductivity type each having a gate electrode connected in series between said first bit line and second bit line,

said first field effect transistor having its gate electrode connected to said command line,

said second field effect transistor having a first gate capacity formed between the gate electrode of said second field effect transistor and a predetermined first potential,

a third field effect transistor having a gate electrode connected between said first bit line and the gate electrode of said second field effect transistor,



said third field effect transistor having its gate electrode connected to said word line, and

a fourth field effect transistor having a gate electrode connected between said coincidence detection line and said first potential,

said fourth field effect transistor having its gate electrode connected to a connection node between said first and second field effect transistors,

said fourth field effect transistor having a second gate capacity formed between the gate electrode of said fourth field effect transistor and said first potential.

4,965,768

SEMICONDUCTOR DEVICE HAVING PROGRAMMABLE READ ONLY MEMORY CELLS FOR SPECIFIC MODE

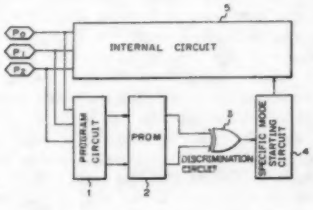
Atsushi Takeuchi, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Dec. 8, 1987, Ser. No. 130,691

Claims priority, application Japan, Dec. 20, 1986, 61-302811

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—201 **11 Claims**



1. A semiconductor device, comprising:

a programmable read only memory;

an internal circuit operating under a normal mode and a specific mode corresponding from said programmable read only memory;

terminals;

a program circuit operatively connected to said terminals and said programable read only memory for programing said programable read only memory in accordance with potentials of said terminals; and

a discrimination circuit operatively connected to said programable read only memory for discriminating contents of said specific mode from said programmable read only memory, and for outputting a control signal designating said specific mode from said programmable read only memory so that said internal circuit operating under a normal mode is brought to said specific mode in response to said control signal.

4,965,769

SEMICONDUCTOR MEMORY CAPABLE OF HIGH-SPEED DATA ERASING

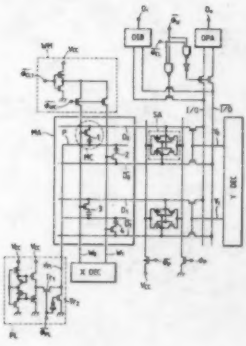
Jun Etoh; Kiyoo Itoh, both of Tokyo; Masakazu Aoki, Saitama, and Ryoichi Hori, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 278,025

Claims priority, application Japan, Dec. 4, 1987, 62-305638

Int. Cl.[5] G11C *11/409*

U.S. Cl. 365—218 **23 Claims**



1. A semiconductor memory comprising:

a plurality of word lines;

a plurality of data lines arranged to intersect said word lines;

memory cells arranged at nodes of said word lines and said data lines and each having a field effect transistor and a capacitor;

first means for selecting a plurality of said word lines, wherein the first means simultaneously accesses all the memory cells by selecting all word lines of an array when the semiconductor memory is in clear mode;

second means for selecting a plurality of said data lines;

plate voltage control means for controlling a voltage at one plate of each of the capacitors in said memory cells, wherein the plate voltage control means changes a voltage at the plate to a preselected clear mode voltage when the semiconductor memory is in clear mode and subsequently changes the plate voltage for normal operation at the end of the clear mode;

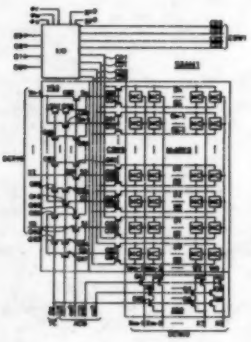
writing means for writing preselected data in all the memory cells by data communication through the data lines during the clear mode, the preselected data being a logic "1" data, so as to complete the writing of a preselected data in the memory cells.

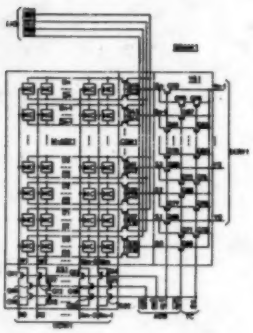
4,965,770

SEMICONDUCTOR MEMORY CAPABLE OF SIMULTANEOUSLY READING PLURAL ADJACENT MEMORY CELLS

Kazumasa Yanagisawa, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 25, 1987, Ser. No. 101,380
Claims priority, application Japan, Sep. 26, 1986, 61-225992
Int. Cl.[5] G11C *11/418*
U.S. Cl. 365—238.5 6 Claims





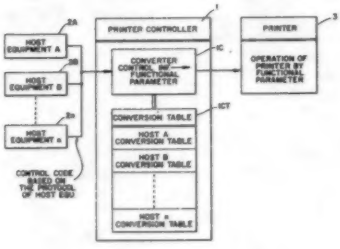
1. A semiconductor memory comprising:
a plurality of word lines;
a plurality of data lines;
a plurality of memory cells, each memory cell disposed adjacent to each intersection between said plurality of word lines and said plurality of data lines;
first decode means coupled to said plurality of word lines for selecting a group of word lines of said plurality of word lines on the basis of first address signals;
first switch means coupled between said plurality of word lines and said first decode means for setting one or more word lines in said group of word lines to a selected voltage level in accordance with first complementary address signals (axo, axo) and a control signal (ϕz); and
wherein said first switch means includes,
a first switching field effect transistor (Q1) coupled between a first word line (WO) of said plurality of word lines and a word line select signal line to be supplied an output signal (XO) of said first decode means,
a second switching field effect transistor (Q11) coupled between a second word line (W1) of said plurality of word lines and said word line select signal line,
third and fourth switching field effect transistors (Q15, Q16) coupled in series with each other and coupled in parallel with said second switching field effect transistor (Q11), and
fifth and sixth switching field effect transistors (Q5, Q6) coupled in series between a third word line (W2) in said group of word lines and said word line select signal line.

4,965,771

PRINTER CONTROLLER FOR CONNECTING A PRINTER TO AN INFORMATION PROCESSOR HAVING A DIFFERENT PROTOCOL FROM THAT OF A PRINTER

Takashi Morikawa, Toyokawa, Japan, and Yoshikazu Ikenoue, Fort Lee, N.J., assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 14, 1987, Ser. No. 85,409
Claims priority, application Japan, Aug. 18, 1986, 61-191683; Aug. 18, 1986, 61-191684
Int. Cl.[5] G06F *3/12*
U.S. Cl. 364—900 4 Claims



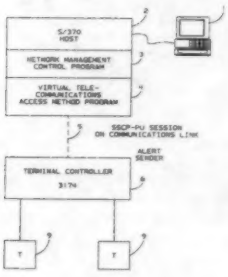
1. A printer controller capable of connecting a printer having a protocol, to any one of a plurality of information processing equipments each having a protocol different from that of the printer, which comprises:
data receiving means which receives, from an information processing equipment to which the printer is connected, printer control data based on the specific protocol of the information processing equipment, and recording data representing an image to be printed;
conversion means which converts the control data received by said data receiving means into at least one printer control command corresponding to at least one function specified by the control data, said conversion means including a plurality of conversion tables corresponding to a plurality of information processing equipments each having a protocol different from that of the printer, selecting means for selecting one of the plurality of conversion tables corresponding to the information processing equipment connected to the printer, and a common conversion program for accessing said one of the plurality of conversion tables responsive to said selecting means and using said one of the plurality of conversion tables to convert the control data received by said data receiving means into said at least one control command; and
control means which controls the printer responsive to said at least one converted printer control commands to obtain a print corresponding to the recording data.

4,965,772

METHOD AND APPARATUS FOR COMMUNICATION NETWORK ALERT MESSAGE CONSTRUCTION

Arthur A. Daniel, Rochester, Minn.; Robert E. Moore, Durham, N.C.; Catherine J. Anderson, Raleigh, NC; Thomas J. Gelm, Raleigh, NC; Raymond F. Kiter, Poughkeepsie, NY; John P. Meeham, Raleigh, NC; John G. Slenenson, Raleigh, NC; Lawrence E. Troan, Raleigh, NC., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 15, 1987, Ser. No. 63,618
Int. Cl.[5] G06F *15/403*
U.S. Cl. 364—900 14 Claims



1. An event notification device for a communication network wherein there exist a plurality of types of events of which notification is provided, the notification device comprising:

means for receiving a plurality of code points associated with an event;

an index for cross referencing said code points to units of text corresponding to said code points;

text providing means coupled to the means for receiving said code points, for utilizing said index to provide said units of text; and

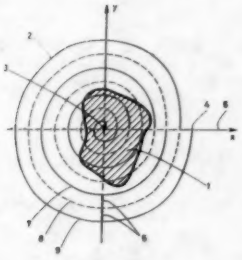
display means coupled to said text providing means for combining said units of text to form a display describing the event with which said code points are associated.

4,965,773

METHOD FOR RECORDING SEISMIC DATA

Roland Marschall, Hanover, Fed. Rep. of Germany, assignor to Prakla-Seismos AG, Hanover, Fed. Rep. of Germany

Filed Dec. 9, 1988, Ser. No. 282,134
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1987, 3742147; Dec. 12, 1987, 3742528
Int. Cl.[5] G01V *1/38*
U.S. Cl. 367—15 5 Claims



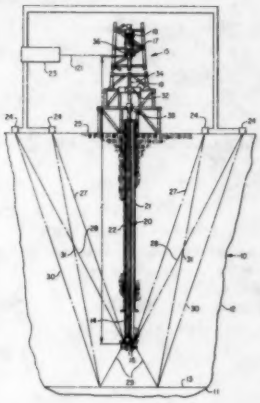
1. A method of gathering and mapping seismic data of a marine region of a type having a stationary body therein comprising the steps of defining a spiral path using a point on the body as the origin of the spiral, and towing a transmitter/-receiver streamer along the spiral path to gather seismic data.

4,965,774

METHOD AND SYSTEM FOR VERTICAL SEISMIC PROFILING BY MEASURING DRILLING VIBRATIONS

Fred W. Ng, Dallas; James P. DiSiena, Plano, and Amjad A. Bseisu, Dallas, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 26, 1989, Ser. No. 385,621
Int. Cl.[5] B01V *1/40*; E21B *47/022*
U.S. Cl. 367—75 13 Claims



1. A method for obtaining seismic data pertaining to an earth formation while forming a wellbore in said formation with a drillstring having a drillbit or the like disposed at the lower distal end thereof, said method comprising the steps of:

providing vibration sensing means connected to an upper region of said drillstring, said vibration sensing means being adapted to produce electrical signals related to vibrations of said drillstring;

providing an array of seismometers disposed generally on the earth's surface in the vicinity of said wellbore;

measuring first signals generated by said vibration sensing means resulting from vibrations of said drillstring;

measuring second signals generated by said array of seismometers resulting from vibrations transmitted through said formation; and

comparing said first signals and said second signals to determine selected characteristics of said formation including the step of calculating the location of origin of said first signal based on the difference in time of arrival at said vibration sensing means of a torsional vibration signal and an axial vibration signal transmitted through said drillstring and at least one of the torsional wave speed and the axial wave speed in said drillstring to determine the origin in time of said first signal.

4,965,775

IMAGE DERIVED DIRECTIONAL MICROPHONES

Gary W. Elko, Summit; Robert A. Kubli, Whitehouse, both of N.J.; Jeffrey P. McAteer, Fishers, Ind., and James E. West, Plainfield, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 19, 1989, Ser. No. 354,535
Int. Cl.[5] G01S *3/86*
U.S. Cl. 367—119 19 Claims

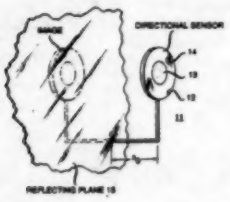
1. An acoustic sensor arrangement, which comprises:

a directional acoustic sensor unit having first-order gradient characteristics

an acoustically reflecting surface

said sensor unit being positioned relative to said reflecting

surface whereby the acoustic interaction between said sensor unit and said surface causes the output of said



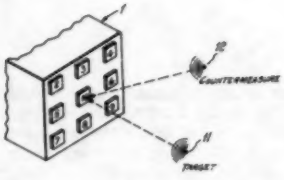
sensor unit to have a second-order gradient response pattern.

4,965,776

PLANAR END-FIRE ARRAY

William J. Mueller, Portsmouth, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 22, 1969, Ser. No. 795,770
Int. Cl.[5] G01J *15/00*
U.S. Cl. 367—126 **17 Claims**



1. An end-fire acoustic transducer array comprising:
a planar matrix of acoustic transducer elements,
each of said transducer elements having a predetermined gain, such that the total gain of selected elements of said matrix is equal to the total gain of the remaining elements in said matrix; and
phase shifting means connected to said selected elements for reversing the phase of the output signals generated by these elements when said matrix is operated in an active mode and for reversing the phase of the input signals to these elements when said matrix is operated in a passive mode.

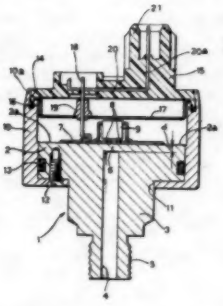
4,965,777

VERY-HIGH-PRESSURE TRANSDUCER, PARTICULARLY FOR DETECTING THE PRESSURE OF A HYDRAULIC FLUID

Gian Maria Timossi, Piacenza; Giuseppina Rossi, Travacò Siccomario, and Dell'Orto, Milan, all of Italy, assignors to Marelli Autronica S.p.A., Milan, Italy

Filed Jul. 21, 1989, Ser. No. 382,593
Claims priority, application Italy, Jul. 21, 1988, 67689 A/88
Int. Cl.[5] H04R *17/00*
U.S. Cl. 367—140 **5 Claims**

1. A very-high-pressure transducer comprising a support structure carrying at least one piezoresistive sensor of the thick-film type adapted to be deformed resiliently by the fluid pressure to be measured and to provide an electrical signal indicative of the value of the pressure, the support structure comprising a metal body having an enlarged head and a reduced shank, an axial blind hole located in the shank for containing a fluid whose pressure is to be measured, the hole extending into the head and having an end surface spaced from an upper surface of the head to define a wall of integral one piece construction with the body which is resiliently deformable by the pressure to be measured; each piezoresistive sensor



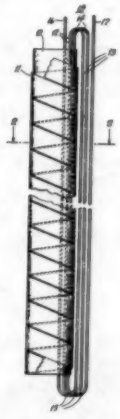
being connected to the upper surface of the head of the body in correspondence with the deformable wall so that said sensor can in turn be deformed as a result of the deformation of the wall.

4,965,778

HELICAL MAGNETOSTRICTIVE CORE LINE HYDROPHONE

David E. Parker, Pawcatuck, and Markay Malootian, Quaker Hill, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 23, 1969, Ser. No. 827,252
Int. Cl.[5] H04R *15/00*
U.S. Cl. 367—168 **4 Claims**



1. A magnetostrictive flexible line hydrophone which comprises:
a flexible hollow thin-walled tube of a pressure release material,
a thin flat ribbon-likestrip of magnetostrictive material helically wound about and against the outer surface of said tube,
an inner layered group of equal length insulated electrical conductors longer than the tube disposed longitudinally within the tube and adjacent the inner surface of said tube and extending beyond the ends of the tube,
an outer layered group of insulated electrical conductors of

the same number and length as the inner group and disposed longitudinally of and adjacent the outer surface of said helically wound magnetostrictive strip,

electrically conductive means joining all but one of the ends of said inner group of conductors to all but one of the ends of said outer group of conductors respectively to form a toroidal winding about said helically wound strip, whereby said strip is a magnetic core of the toroidal winding,

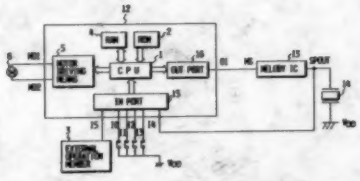
whereby when the two non-connected conductor ends are connected to a receiver and said line hydrophone placed in water the presence of acoustical energy will be detected.

4,965,779

MULTI-FUNCTIONAL ELECTRONIC TIMEPIECE

Tomozumi Saruwatari, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

Filed Oct. 25, 1989, Ser. No. 427,038
Claims priority, application Japan, Oct. 25, 1988, 63-268573
Int. Cl.[5] G04B *19/04, 21/00*
U.S. Cl. 368—80 **7 Claims**



1. A multi-functional electronic timepiece having hands for analog indication and motor means to drive the hands comprising;

timekeeping means for keeping a present time including commanding means for generating a melody starting command signal;

motor driving means for driving said motor means;

acoustic means responsive to input of said melody starting command signal for emitting a sound having a predetermined rhythm, having speaker means for audible sound emission; and

means for controlling said motor driving means so that said time indication means is driven in a different way from normal time indication in synchronism with said sound emission having a capacity for storing a plurality of basic hand operation patterns and means for selecting a predetermined number of said basic hand operation patterns.

4,965,780

MAGNETO-OPTICAL DATA RECORDING DEVICE USING A WAVELENGTH AND POLARIZATION-SENSITIVE SPLITTER

Neville K. S. Lee, Medfield, and James Howard, Natick, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 12, 1987, Ser. No. 84,577
Int. Cl.[5] G11B *11/12, 7/12, 13/04*
U.S. Cl. 369—13 **7 Claims**

1. A mass storage device for use in a data processing system, said device comprising:

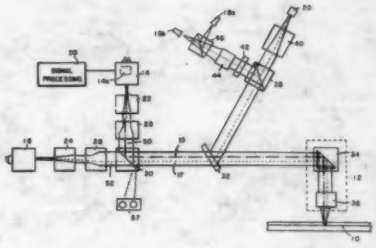
A. a rotating magneto-optical storage medium;

B. read laser means for providing a read laser beam having a first wavelength and a p-polarization;

C. write laser means for providing a write laser beam having a second wavelength and an s-polarization orthogonal to the p-polarization of the read laser beam;

D. polarizing beam splitter means fed by the read and write laser beams, for providing a polarized read and write laser beams;

E. optical head means, fed by the polarized read and write laser beams for presenting the polarized read and write laser beams to the storage medium and providing a read return beam and a write return beam reflected by the medium; and



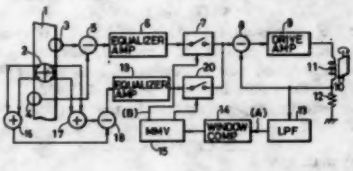
F. dichroic beam splitter means, disposed between the polarizing beam splitter means and the optical head means, high transmittance at the write laser beam wavelength and polarization, almost complete transmittance at the write return beam wavelength and polarization, and high reflectance at the read return beam wavelength and polarization.

4,965,781

DATA READING DEVICE HAVING SERVO CONTROLLED POSITION RESET

Tohru Akiyama, and Takashi Okano, both of Saitama, Japan, assignors to Pioneer Video Corporation, Yamanashi, Japan

Filed May 19, 1983, Ser. No. 495,930
Claims priority, application Japan, May 19, 1982, 57-84407
Int. Cl.[5] G11B *7/09*
U.S. Cl. 369—44.35 **11 Claims**



1. A data reading device of the type wherein data is detected from a detection point on a record medium, said device comprising actuating means movable away from an initial position to move the location of said detection point on said medium, drive means for driving said actuating means in response to a driving signal and first means for providing a first signal as said drive signal to said drive means, said device further comprising:

first disabling means for interrupting said first signal when the amount of movement of said actuating means from said initial position exceeds a predetermined value;

means for generating a second signal having an amplitude corresponding to the amount of movement of said actuating means from said initial position; and

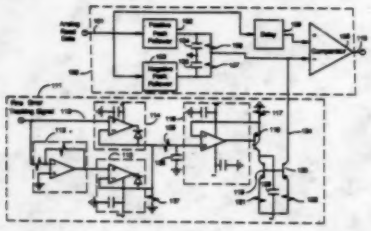
second means for providing said second signal as said drive signal to said drive means during interruption of said first signal, to thereby move said actuating means back to said initial position.

4,965,782

OFF-TRACK BIT SHIFT COMPENSATION APPARATUS

Harlan P. Mathews, Boulder, Calif., assignor to Storage Technology Partners II, Louisville, Colo.

Filed May 26, 1988, Ser. No. 199,242
Int. Cl.[5] G11B 7/00
U.S. Cl. 369—48.000 16 Claims



9. Apparatus for compensating for tracking misalignment between a read head and data storage tracks on a circular optical disk, said data storage tracks including a plurality of circular concentrically arranged data storage tracks written on said optical disk, and said read head concurrently reading at least two selected data storage tracks, comprising:

means for generating a signal indicative of the timewise displacement of data transitions detected on a first selected data storage track read by said read head and data transitions on a second selected data storage track along the entire length of both said concentrically arranged first and second selected data storage tracks; and

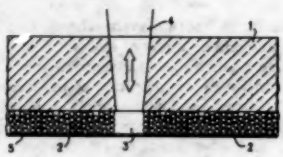
data transition detection means responsive to said signal for adjusting a threshold used to detect data transitions on said first selected data storage track read by said read head to eliminate said timewise displacement.

4,965,783

COMPATIBLE POLYMERS, AND USE OF SAME FOR REGISTERING OPTICALLY READABLE INFORMATION

Werner Siol, Darmstadt-Eberstadt, and Ulrich Terbrack, Reinheim, both of Fed. Rep. of Germany, assignors to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Feb. 26, 1988, Ser. No. 161,035
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1987, 3708428
Int. Cl.[5] G11B 7/00
U.S. Cl. 369—100 75 Claims



1. A method for recording, storing, and displaying optically readable information in a plastic material which can be modified in an optically differentiable way under the action of thermal energy, or a form of energy directly convertible into thermal energy, comprising the steps of:

preparing a plastic material comprising a polyblend mixture, said polyblend mixture comprising at least two disparate polymers which are mutually compatible, said polyblend mixture having an upper critical solution temperature UCST;

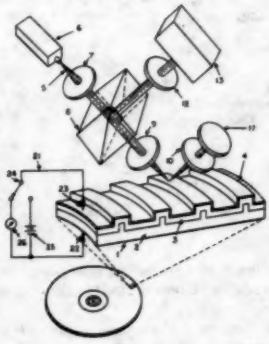
modifying said plastic material in an optically differentiable manner to store information by inducing a phase transformation from a compatible single-phase mixture system above the UCST to a de-blended two-phase mixture system comprising individual polymer domains of the disparate polymers below the UCST; or modifying said plastic material by inducing the reverse phase transformation from said de-blended system to said compatible system.

4,965,784

METHOD AND APPARATUS FOR BISTABLE OPTICAL INFORMATION STORAGE FOR ERASABLE OPTICAL DISKS

Cecil E. Land, and Ira D. McKinney, both of Albuquerque, N. Mex., assignors to Sandia Corporation, Albuquerque, N. Mex.

Filed May 31, 1988, Ser. No. 200,095
Int. Cl.[5] G11B 7/00
U.S. Cl. 369—100 30 Claims



1. A method of bistable storage of optical information, which comprises:

providing a material capable of shifting between stable first antiferroelectric and second ferroelectric phases by applying at least one of electric energy and illumination energy thereto,

applying an electrical field across a surface of the material, so that the material shifts from the first phase to the second phase,

illuminating parts of the material, thereby causing the illuminated parts to shift back to the first phase,

removing the illumination and electrical field so that the illuminated parts remain in the first phase and the unilluminated parts remain in the second phase, and

directing a read light beam onto the portion of the material and determining the first and second phase parts thereof.

4,965,785

OPTICAL HEAD INCLUDING A COLLIMATOR HAVING LENSES OF DIFFERENT FOCAL LENGTHS

Michihiro Tadokoro, and Kazuo Okada, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1988, Ser. No. 217,933
Claims priority, application Japan, Jul. 14, 1987, 62-176304; Jan. 20, 1988, 63-11254
Int. Cl.[5] G11B 7/12
U.S. Cl. 369—112 8 Claims

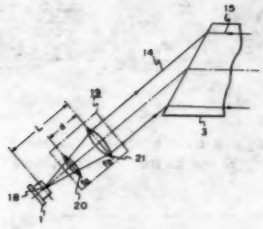
1. An improved optical head for a recording and reproducing apparatus comprising:

a light source means;

an objective lens means for focusing parallel light fluxes onto an information carrier means;

a collimator lens means including a pair of lenses, each having different focal lengths, in optical communication with said light source means and said objective lens means;

means for spacedly disposing said pair of lenses in an optical-axis direction between said light source means and said



objective lens means wherein one lens is closer to and the other lens is more remote from said light source means;

means for moving one of said pair of lenses in the optical-axis direction to adjust the relative position of said lens to said light source;

a beam splitter means for separating light fluxes; and

means for disposing said beam splitter means within said collimated parallel light fluxes between said pair of lenses and said objective lens means.

4,965,786

ECHO CANCELLER FOR A VARIABLE-PHASE ECHO SIGNAL

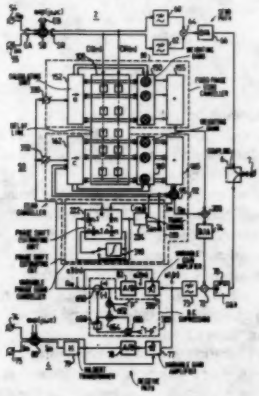
Bertrand Salle, Paris, France, assignor to Telecommunications Radio-electronics et Telephoniques T.R.T., Paris, France

Filed Mar. 22, 1989, Ser. No. 327,225

Claims priority, application France, Mar. 25, 1988, 88 03938

Int. Cl.[5] H04B *3/23*

U.S. Cl. 370—32.1 **15 Claims**



1. An echo canceller for cancelling a variable phase echo signal, comprising:

(a) means for connecting the echo canceller between first and second one-way signal paths, one of the first and second signal paths being a send path and the other of the first and second signal paths being a receive path,

(b) phase shifting means,

(c) an adaptive filter, cooperating with the phase shifting means, for forming a replica of the echo signal,

(d) a subtractor inserted in the receive path for supplying a difference signal between the echo signal and the replica of the echo signal,

(e) a suppressing circuit for suppressing the d.c. component of the difference signal, which suppressing circuit supplies an adjusting quantity for use by the adaptive filter and the phase shifting means and which suppressing circuit operates by means of adaptive computation,

(f) a phase estimating means for forming at an instant t+1, a phase value $\phi(t+1)$ on the basis of a previous value $\phi(t)$ and a phase deviation $\Delta\phi(t)$, and

(g) an integrating circuit, within the phase shifting means, for effecting an integration $\Delta\phi(t)$ of the phase deviation $\Delta\phi(t)$.

4,965,787

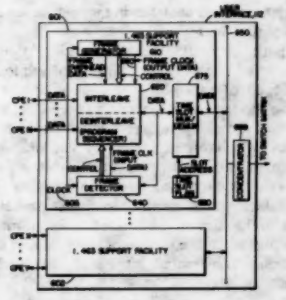
METHODS AND APPARATUS FOR MULTIPLEXING SUB-RATE CHANNELS IN A DIGITAL DATA COMMUNICATION SYSTEM

Gary R. Almond, Frederick, and David W. Storey, Dickerson, both of Md., assignors to Data General Corporation, Westboro, Mass.

Filed Feb. 9, 1989, Ser. No. 308,705

Int. Cl.[5] H04J *3/22*

U.S. Cl. 370—58.1 **13 Claims**



1. A method for multiplexing a sub-rate channel, in accordance with a predefined multiplexing protocol, on a data path in a digital communication switching system that has a switching granularity of "x" bits per second, wherein said data path has a bandwidth divided into "m" slots, the slots each being further subdivided into "n" fragments, comprising the steps of:

(a) inputting said sub-rate channel to means capable of performing single step rate adaptation, wherein said means for performing rate adaptation is operative to insert data bits from said channel into successive, equal width "t" bit frames utilizing only a single level of framing, in accordance with said protocol;

(b) creating each of said t bit frames utilizing frame generator means, such that each bit in a t bit frame corresponds to a channel carrying capacity that can be expressed as an integral number of bits per second;

(c) interleaving the sub-rate data into the proper position in each of said t bit frames as defined by said protocol;

(d) inserting information bits into the remaining bit positions of each of said t bit frames; and

(e) outputting the successive t bit frames for transmission through the switching system.

4,965,788

SELF-ROUTING SWITCH ELEMENT FOR AN ASYNCHRONOUS TIME SWITCH

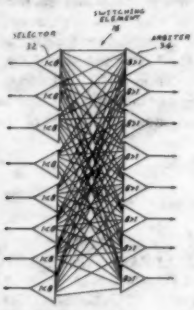
Peter Newman, Cambridge, England, assignor to Network Equipment Technologies, Inc., Redwood City, Calif.

Filed Oct. 14, 1988, Ser. No. 258,291

Claims priority, application United Kingdom, Oct. 15, 1987, 8724208

Int. Cl.[5] H04Q 11/04; H04J 3/24

U.S. Cl. 370—60 13 Claims



1. A self-routing switching element for use in an asynchronous time switch, comprising:

a plurality of selectors each having an input for incoming tagged packet signals;

a plurality of arbiters each having an output for a transmitted packet signal; and

a signal path connection between each of said plurality of selectors and each of said plurality of arbiters;

wherein each of said plurality of selectors is operable to examine the tag of an incoming tagged packet signal and route said incoming tagged packet signal to one of said plurality of arbiters identified by said examined tag, and wherein each of said plurality of arbiters is operable to select a first packet signal received from any of said plurality of selectors and transmit said first packet signal to its output, and to act on other ones of said plurality of selectors to prevent subsequent incoming tagged packet signals from being transmitted until said first packet signal is transmitted.

4,965,789

MULTI-RATE VOICE ENCODING METHOD AND DEVICE

Francoise Bottau, Nice; Claude Galand, Cagnes Sur Mer, and Michele Rosso, Nice, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 7, 1989, Ser. No. 320,146

Claims priority, application European Pat. Off., Mar. 8, 1988, 88480007

Int. Cl.[5] G10L 9/14

U.S. Cl. 370—79 7 Claims

1. A process for multirate encoding a voice originating signal using Code-Excited techniques wherein the voice originating signal is considered by blocks of samples and each block is subsequently converted into a prestored table address k and a gain factor g, said multirate process including:

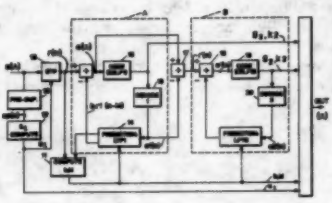
first Code-Excited coding said voice originating block into a first table address k1 and a gain g1;

decoding said first Code-Excited coded block;

subtracting said decoded block from a non-coded voice originating block to derive an error signal block therefrom;

second Code-Excited coding said error signal block into a second table address k2 and a gain g2; and

multiplexing both (g1, k1) and (g2, k2) data into a single full rate frame;



whereby coding at a lower predetermined rate is achieved by simply dropping g2 and k2 from the considered frame.

4,965,790

COMMUNICATION SYSTEM FOR FORMING DIFFERENT NETWORKS ON THE SAME RING TRANSMISSION LINE

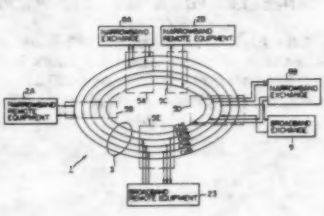
Tetsuo Nishino; Osamu Isono; Tetsuo Tachibana, all of Kawasaki; Eisuke Iwabuchi, Yokohama, and Toshimasa Fukui, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 8, 1989, Ser. No. 320,574

Claims priority, application Japan, Mar. 9, 1988, 63-055506

Int. Cl.[5] H04J 3/17

U.S. Cl. 370—85.12 21 Claims



1. A ring transmission system comprising:

a ring transmission line, having a plurality of communication channels, for transmitting data through the plurality of communication channels; and

a plurality of nodes connected to said ring transmission line, the communication channels being allocated for use by said nodes, each of said nodes includes

drop/insert means for one of dropping data from said ring transmission line and inserting data into said ring transmission line, by utilizing one of the one or more communication channels allocated to one of said nodes corresponding thereto; and

allocation changing means for changing the allocation of the one or more communication channels allocated to the one of said nodes corresponding thereto;

wherein, between said nodes having the same communication channel allocated thereto, an independent exchange network is constructed so that a plurality of independent exchange networks are constructed by said plurality of nodes and said ring transmission line, and the construction of the independent exchange networks being variable by changing the allocation of the communication channels through the control signaling between nodes.

4,965,791

NETWORK TOPOLOGY CONTROL METHOD AND APPARATUS

Jerry Hutchison, Littleton; Henry Yang, Andover, and William Hawe, Pepperell, all of Mass., assignors to Digital Equipment Corporation, Maynar, Mass.

Filed Jul. 25, 1988, Ser. No. 224,038
Int. Cl.[5] H04J 3/24
U.S. Cl. 370—94.1 57 Claims

1. A method for automatically controlling the topology of a local area network (LAN) having a plurality of stations, each of the stations being any one of a single attachment station (SAS), a dual attachment station (DAS), a wire concentration station (WC), or a DAS/WC station, the plurality of stations each having a PHY layer interface and each being interconnected by duplex point to point physical connections, comprising the steps of:

exchanging station connections information over the physical connections only between adjacent stations;

determining, in each of the stations by analysis of said exchanged information, the validity of all connections to each of said adjacent stations according to a predetermined connection validation list;

identifying invalid connections according to said validation list; and

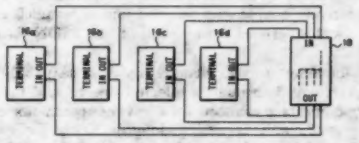
rejecting said invalid connections from the topology of the LAN.

4,965,792

COLLISION/DETECTION SINGLE NODE CONTROLLED LOCAL AREA NETWORK

Takashi Yano, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 947,525, Dec. 29, 1986, abandoned.
This application Feb. 7, 1990, Ser. No. 477,130
Claims priority, application Japan, Jan. 9, 1986, 61-2774; Mar. 12, 1986, 61-53992; Mar. 12, 1986, 61-53993
Int. Cl.[5] H04L 5/22
U.S. Cl. 370—85.2 42 Claims



1. A communication network control system having:

a plurality of nodes which are interconnected by links;

a plurality of transmit/receive terminals connected to said nodes; and

connection control means installed in each of said nodes for controlling connection of a plurality of input channels and output channels which correspond to said input channels;

said connection control means connecting any one of the input channels, on which first forward information has arrived earliest, to all of the output channels which have not been used for other communications, or to any of said output channels except for an output channel corresponding to the input channel on which first forward information has arrived earliest, and disconnecting any input channels except for any of said input channels which have not been used for other communications from said output channels;

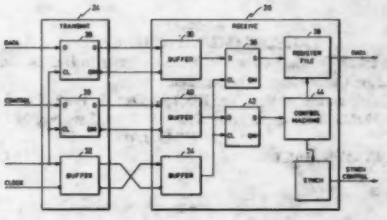
the improvement wherein each of said nodes compares a phase of an input signal arrived first on any of said input channels and a phase of an input signal arrived on another of said input channels later than said signal arrived first so as to detect any said input channels on which a differential resulting from the comparison is greater than a predetermined value, thereby detecting that a collision has occurred between said node and another node or any of said terminals to which said input channel detected is connected.

4,965,793

METHOD AND APPARATUS FOR INTERFACING A SYSTEM CONTROL UNIT FOR A MULTI-PROCESSOR

R. Stephen Polzin, Holden; Roger G. Niles, Marlboro, and Rueysen Lin, Lexington, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 3, 1989, Ser. No. 306,862
Int. Cl.[5] H04J 3/24
U.S. Cl. 370—94.1 16 Claims



1. An interface for transferring data packets between a system control unit and an input/output unit, comprising:

transmitting means for sequentially transmitting said data packets between said system control unit and said input-/output unit; and

receiving means for sequentially receiving said data packets transmitted between said system control unit and said input/output unit;

said transmitting means including:

packet transmit queue means for temporarily storing requests to transmit selected ones of said data packets;

transmit buffer means for storing a plurality of said data packets and transmitting the selected ones of said data packets and corresponding parity signals indicating the parity of the selected data packets; and

means for transmitting respective command available signals to signal the transmission of said selected data packets;

said receiving means including:

receive buffer means for responding to said command available signals by allocating storage space for said selected data packets, and sequentially receiving and storing said selected data packets;

means for controllably unloading said selected data packets from said receive buffer means;

means for returning respective buffer emptied signals to said transmitting means in response to said selected data packets being unloaded from said receive buffer means;

means for receiving the parity signals and comparing the respective parity signals to the parity of the corresponding data packets received by the receiving means;

means for returning respective acknowledge signals to the transmitting means in response to the respective parity signals being consistent with the parity of corresponding data packets received by the receiving means; and

means for returning respective retry signals to said transmitting means in response to the respective parity signals

being inconsistent with the parity of corresponding data packets received by the receiving means; and

said transmitting means further including:

means for receiving the returned buffer emptied signals, and in response to the returned buffer emptied signals calculating the number of data packets stored in said receive buffer means;

means for preventing said transmitting means from transmitting additional data packets in response to said calculated number being of a preselected magnitude;

means for receiving said retry signals and restarting the transfer of the data packets corresponding to said retry signals; and

means for receiving said acknowledge signals and retiring the data packets corresponding to said acknowledge signals,

wherein said transmitting means and said receiving means are interconnected and separated by a multi-line bus, and said transmitting means and said receiving means each include a separate control means for controlling the transferring of the data packets across the multi-line bus by handshaking of the signals across said multi-line bus without the use of a central control.

4,965,794

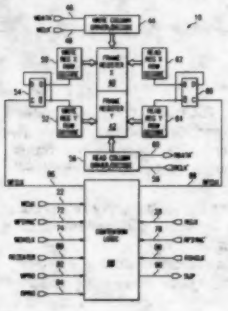
TELECOMMUNICATIONS FIFO

Michael D. Smith, Lewisville, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.

Continuation of Ser. No. 105,739, Oct. 5, 1987, Pat. No. 4,839,893. This application Jun. 13, 1989, Ser. No. 366,709

Int. Cl.[5] H04J *3/06*

U.S. Cl. 370—105.1 **17 Claims**



1. A FIFO memory for receiving and storing a synchronous serial bit stream of N-bit packets of data, and for reading out corresponding stored data, comprising:

a first register having N storage locations;

a second register having N storage locations;

write circuitry for writing data into said first register until said FIFO memory has received and written an N-bit packet of data into said N storage locations in said first register and for writing data into said second register until said FIFO memory has received and stored an N-bit packet of data into said second register;

write register selection circuitry for selecting which register is to be written into by said write circuitry;

read circuitry for reading at least a portion of the data bits stored in said N memory locations of said first register and for reading at least a portion of the data bits stored in said N storage locations of said second register;

read register selection circuitry for selecting which register is to be read from by said read circuitry; and

circuitry for detecting whether the storage location being read from and the storage location being written into are in a predetermined relationship with each other at a time when data is being written into said first register, and, if such predetermined relationship exits, for causing said write register selection circuitry to cause the next N-bit packet of data to be written into said first register at the completion of writing the present N-bit packet of data into said first register, and if said predetermined relationship does not exist, for causing said write register selection circuitry to cause the next N-bit packet of data to be written into said second register upon the completion of the writing of the present N-bit packet of data into said first register;

wherein said predetermined relationship indicates whether a collision is predictable within the next frame of data.

4,965,795

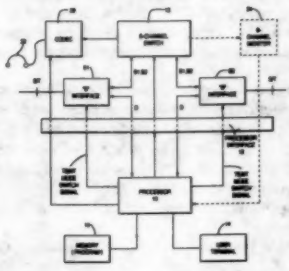
D CHANNEL MONITOR

Steven R. Coffelt, and Thomas W. Durston, both of Camarillo, Calif., assignors to Harris Corporation, Melbourne, Fla.

Filed May 10, 1988, Ser. No. 192,174

Int. Cl.[5] H04J *3/14*

U.S. Cl. 370—110.1 **11 Claims**



1. A D channel monitor for use with an ISDN terminal comprising:

first and second interface elements including means to permit each of the interface elements to appear selectively as one of a network termination interface and a terminal equipment interface;

a controller coupled to said first and second interface elements, wherein said controller includes means for controlling said first and second interface elements to appear selectively as predetermined ones of said network termination interface and said terminal equipment interface to respectively couple to a selected one of terminal equipment and a network termination of said ISDN terminal; and

means for monitoring D channel signals in said ISDN network received through a selected one of said first and second interface elements for allowing examination of the content of messages passing along the D channel,

wherein said first and second interface elements are S interface elements.

4,965,796

MICROPROCESSOR-BASED SUBSTRATE MULTIPLEXER/DEMULTIPLEXER

Norman W. Petty, Boulder, Colo., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 29, 1989, Ser. No. 415,144

Int. Cl.[5] H04J *3/22*

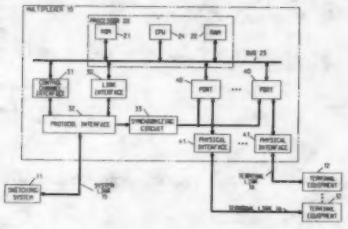
U.S. Cl. 370—112 **17 Claims**

1. A subrate multiplexer comprising

means for receiving a plurality of first signal streams each at a subrate of a predetermined transmission rate;

a general-purpose programmable processor having a central processing unit and storage means, connected to the re-

ceiving means and programmed to subrate-multiplex the plurality of received first signal streams into a second signal stream such that the second signal stream comprises a plurality of adjacent frames each having an identical sequence of time slots of equal duration, each one of the plurality of adjacent frames including an identical first framing pattern comprising a sequence of values of framing bits, with different ones of the time slots of a frame carrying signals from different ones of the first signal streams and with sequentially identical time slots of a plurality of the adjacent frames carrying signals from the same first signal stream, wherein the central processing unit under program control forms the second signal stream in the storage means by repeatedly (a) retrieving



from each received first signal stream different sequentially-received signals that will be carried by a single time slot in the second signal stream, (b) storing the signals retrieved from the plurality of first signal streams in the storage means in a sequence in which the time slots that will carry the retrieved signals carry signals from different ones of the first signal streams in the second signal stream, and (c) storing the values of the framing bits of the framing pattern in the storage means next to the first signal streams' stored signals, to interleave the framing pattern with the signals of the first signal streams in the storage means; and

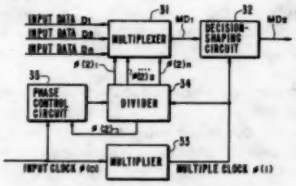
means for transmitting the second signal stream at the predetermined transmission rate.

4,965,797

PARALLEL-TO-SERIAL CONVERTER

Kazuo Yamane, and Masanori Shimasue, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 16, 1989, Ser. No. 367,263
Claims priority, application Japan, Jun. 16, 1988, 63-148662
Int. Cl.[5] H04J 3/02
U.S. Cl. 370—112 **6 Claims**



1. A parallel-to-serial converter for multiplexing a plurality of parallel input data into a serial data, comprising:

(a) means for multiplying an input clock by n, wherein n is an integer greater than or equal to 2, said input clock being in synchronism with one of the plurality of parallel input data and for generating a multiple clock in synchronism with the serial data;

(b) means for dividing the multiple clock by n and generating a plurality of divided clock signals, each of said plurality of clock signals being in synchronism with one of the plurality of parallel input data;

(c) means for converting the plurality of parallel input data into a serial data output in reference to a timing of said plurality of divided clock signals from said dividing means;

(d) means for shaping a waveform of the serial data output from said converting means using the multiple clock from said multiplying means;

(e) means for comparing a phase relationship between the divided clock signal and the input clock representing a phase of one of the plurality of parallel input data; and

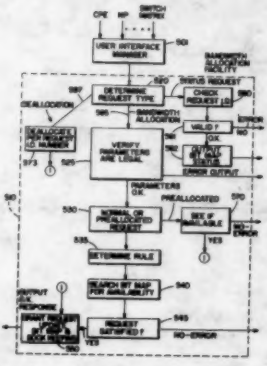
(f) means for adjusting a phase relationship between the plurality of parallel input data and the plurality of divided clock signals under the control of said comparing means.

4,965,798

APPARATUS FOR FLEXIBLY ALLOCATING BANDWIDTH FOR A POINT-TO-POINT, SERIAL, BIDIRECTIONAL COMMUNICATION PATH

Asghar D. Mostafa, Silver Spring, and Kirk H. Berry, Gaithersburg, both of Md., assignors to Data General Corporation, Westboro, Mass.

Filed Feb. 9, 1989, Ser. No. 308,355
Int. Cl.[5] H04J 3/16
U.S. Cl. 370—079 **29 Claims**



1. In a digital data communication system, having a switching granularity of "x" bps, comprising a plurality of point-to-point, serial, bidirectional data paths each having a bandwidth, wherein the bandwidth of at least a first data path is divided into "m" slots, the slots each being subdivided into "n" fragments where the bandwidth of each granularity x, each one of said plurality of data paths being for transporting data within said system in response to a request for bandwidth from at least one of a set of data path users and wherein the system further comprises user interface manager means that stores, identifies and transmits parameters associated with a given user's bandwidth allocation request, and

bandwidth allocation control means, coupled to a first end of said first data path and to said user interface manager means, for controlling allocation of data bandwidth to one or more of the m×n fragments of first data path bandwidth, comprising:

(a) bit map means comprising m×n bit locations, each bit location corresponding to a different fragment on said first data path wherein each one of said m×n bit locations is used for storing a binary bit which takes a value of ZERO for indicating that its corresponding fragment is available or a value of ONE for indicating that its corresponding fragment is in use and unavailable;

(b) allocation means for identifying available fragments on

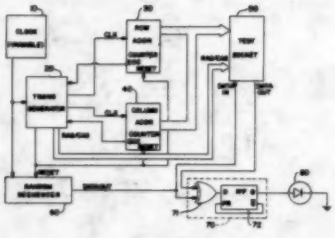
said first data path, in response to a particular data path user's request for bandwidth allocation, as specified by parameters received from said user interface manager means, wherein said allocation means is capable of performing the allocation in accordance with any one of a plurality of predefined rules, each of which define the bandwidth allocation layout request and any constraints.

4,965,799

METHOD AND APPARATUS FOR TESTING INTEGRATED CIRCUIT MEMORIES

George D. Green, College Park, and William C. Mullaney, Baltimore, both of Md., assignors to Microcomputer Doctors, Inc., College Park, Md.

Filed Aug. 5, 1988, Ser. No. 228,687
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—21.2 **16 Claims**



1. An apparatus for testing a dynamic random access memory (DRAM), comprising:

data generating means for generating pseudo-random data bit patterns;

address means for addressing memory cells of the DRAM by producing address signals;

timing generator means for generating timing signals used by the DRAM and for generating timing signals used by said addressing means;

variable clock means, operatively connected to said timing generating means, for producing a variable clock signal to be used by said timing generator means in the generation of said timing signals and to be used by said data generating means in the generation of said pseudo-random data bit patterns;

write means, operatively connected to said data generating means, for writing said pseudo-random data bit patterns into the memory cells of the DRAM in response to said address signals and said timing signals used by the DRAM during a write cycle;

read means for reading said pseudo-random data bit patterns stored in the DRAM in response to said address signals and said timing signals used by the DRAM during a read cycle; and

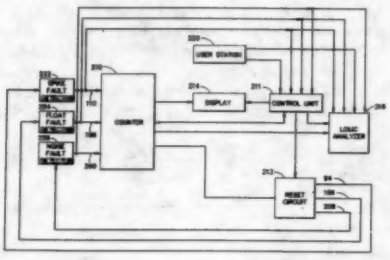
comparing means, operatively connected to said read means, for comparing said pseudo-random data bit patterns read from the DRAM with said pseudo-random data bit patterns generated by said data generating means and for outputting a signal indicative of a non-correspondence between any two bits.

4,965,800

DIGITAL SIGNAL FAULT DETECTOR

William A. Farnbach, 10049 Mesa Madera, San Diego, Calif. 92131

Filed Oct. 11, 1988, Ser. No. 255,352
Int. Cl.[5] G01R *31/28*
U.S. Cl. 371—22.1 **62 Claims**



61. A method of triggering an electronic device, comprising the steps of:

(1) providing a fault detector that tests for a signal fault comprising at least one of a number of fault types including a spike fault, a float fault and a noise fault;

(2) providing an output signal from the signal fault detector, said signal being responsive to a detection of one or more signal faults; and

(3) applying the output signal to trigger the electronic device.

4,965,801

ARCHITECTURAL ARRANGEMENT FOR A SCSI DISK CONTROLLER INTEGRATED CIRCUIT

Keith B. DuLac, Derby, Kans., assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 28, 1987, Ser. No. 101,452
Int. Cl.[5] G06F *13/00, 13/28, 11/00*
U.S. Cl. 371—40.1 **11 Claims**

3. A SCSI disk controller integrated circuit for use with a SCSI data bus, a microprocessor executing a control program, and a disk interface; comprising:

SCSI data and control means for transferring data and control signals to and from the SCSI bus in cooperation with the microprocessor;

buffer means connected to the SCSI data and control means for temporarily storing data as the data is being transferred;

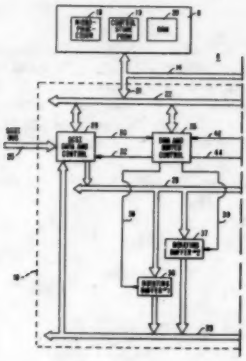
buffer control means connected to the SCSI data and control means and the buffer means for controlling the transfer of data into and out of the buffer means;

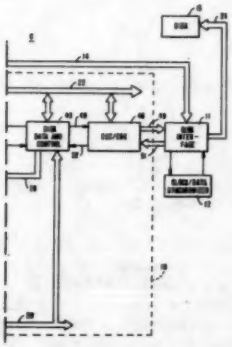
error detection and correction means connected to the disk interface and connected to and cooperating with the microprocessor for detecting or correcting an error in the data transferred between the error detection and correction means and the disk interface;

disk data and control means connected to the buffer means and the buffer control means for controlling the transfer of data between the error detection and correction means and the buffer means in cooperation with the buffer control means; and

direct memory access means connected to the SCSI data and control means, the buffer control means, and the disk data and control means for controlling the transfer of data,

which was inputted from the disk interface, from the buffer means to the SCSI data and control means, and the





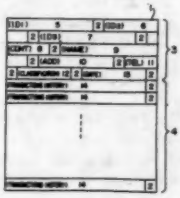
transfer of data, which was inputted from the SCSI bus, from the buffer means to the disk data and control means.

4,965,802

MEMORY ARRANGEMENT UTILIZED FOR IC CARD

Tohru Shinagawa, Toride, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Filed Sep. 15, 1988, Ser. No. 244,861
Claims priority, application Japan, Sep. 17, 1987, 62-233333
Int. Cl.[5] G06F *11/10*; G06K *5/00*
U.S. Cl. 371—51.1 **20 Claims**



1. A memory arrangement system for a memory device to provide efficient and accurate error detection, comprising:

first memory storage area, including plural memory locations, arranged in sequential intervals of constant byte length; and

second memory storage area, including plural memory locations, arranged in sequential intervals of constant byte length;

said first memory storage area storing a plurality of fixed information data, each of a constant byte length, and corresponding error detection data, wherein each of said fixed information data and corresponding error detection data are sequentially stored in said sequential intervals of plural memory locations;

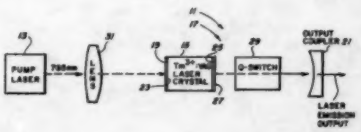
said second memory storage area storing a plurality of variable information data, each of a variable byte length, and error detection data of a constant byte length, wherein said error detection data is stored in predetermined plural memory locations of each of said sequential intervals and each of said variable information data are sequentially stored in the remaining plural memory locations of each of said sequential intervals to thereby create a memory arrangement system capable of providing efficient and accurate error detection.

4,965,803

ROOM-TEMPERATURE, LASER DIODE-PUMPED, Q-SWITCHED, 2 MICRON, THULIUM-DOPED, SOLID STATE LASER

Leon Esterowitz, Springfield, and Robert C. Stoneman, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 30, 1990, Ser. No. 501,461
Int. Cl.[5] H01S *3/30*
U.S. Cl. 372—5 **20 Claims**



1. A room-temperature solid state laser comprising:

a laser cavity defined by first and second reflective elements opposing each other on a common axis to form a reflective path therebetween;

a laser crystal disposed in said laser cavity, said laser crystal having a host material doped with an amount of thulium activator ions sufficient to produce a laser emission at substantially 2 microns from the $^3F_4$ to $^3H_6$ laser transition in said thulium activator ions when said laser crystal is enabled and is pumped by a CW pump beam at a preselected wavelength;

a pump laser for pumping said laser crystal with said CW pump beam at said preselected wavelength; and

means disposed in said laser cavity between said laser crystal and said second reflective element for periodically enabling said laser crystal to produce a pulsed laser emission at substantially 2 microns when said laser crystal is also pumped by said CW pump beam.

4,965,804

KEY MANAGEMENT FOR ENCRYPTED PACKET BASED NETWORKS

Nick G. Trbovich, Pembroke Pines, and Thomas D. Campbell, Coral Springs, both of Fla., assignors to Racal Data Communications Inc., Sunrise, Fla.

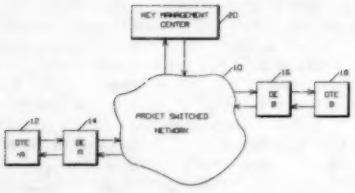
Filed Feb. 3, 1989, Ser. No. 305,672
Int. Cl.[5] H04L *9/00*
U.S. Cl. 380—21 **11 Claims**

1. A method of providing communication between a transparent device and a network service provider in a packet

switched network, a transparent device being defined as a network device which is not addressable by other network devices by a network address, comprising the steps of:

transmitting a call from a source Data Terminal Equipment (DTE) destined for a target DTE;

at said transparent device, intercepting said call from said source DTE to said target DTE and transmitting a call from said transparent device to said network service provider in place of said call from said source DTE;



receiving a response from said network service provider at said transparent device; and

balancing traffic through said transparent device by transmitting a dummy packet from said transparent device to said source DTE in order to make frame send and receive sequence numbers equal and packet send and receive sequence numbers equal.

4,965,805

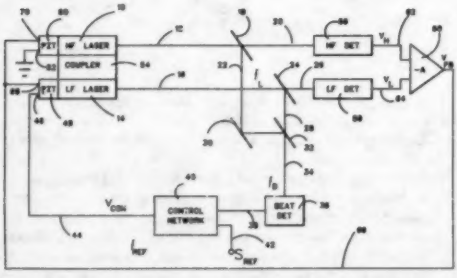
DITHER-FREE ACTIVELY STABILIZED LASER

Cecil L. Hayes, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 5, 1989, Ser. No. 402,284

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—32 **16 Claims**



1. An actively stabilized laser light source comprising:

a higher frequency single mode laser light source which has a higher power-to-frequency response curve, and which is tuned to a higher output frequency, said higher output frequency being higher than a center frequency of said higher response curve;

a lower frequency single mode laser light source which has a lower power-to-frequency response curve, and which is tuned to a lower output frequency, said lower power-to-frequency response curve being at least approximately identical to said higher power-to-frequency response curve, said lower output frequency being lower than a center frequency of said lower response curve, and said higher output frequency differing from said lower output frequency by an at least approximately fixed frequency difference; and

means, responsive to a power difference between the power of said single mode sources or to a difference between monotonic functions of said power of said sources, for increasing said higher and lower output frequencies when said power difference has a first sign, and for decreasing said frequencies of said sources when said power difference has a second sign, opposite to said first sign.

4,965,806

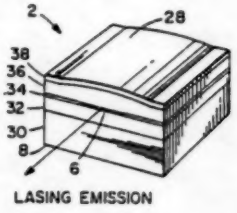
SEMICONDUCTOR LASER DEVICES HAVING LATERAL REFRACTIVE INDEX TAILORING

Carol I. H. Ashby, Edgewood; G. Ronald Hadley, Alburquerque; John P. Hohimer, Albuquerque, and Adelbert Owyoung, Albuquerque, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 15, 1989, Ser. No. 366,398

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—45 **14 Claims**



1. A broad-area semiconductor laser diode, comprising:

a substrate;

an active lasing region disposed between an upper cladding layer and a lower semiconductor layer, to form a diode lasing structure having a heterojuncture;

a contact stripe on an outer layer of said device for application of current to said device to produce said lasing region;

a resonant cavity to provide feedback for lasing action; and

the laser diode further comprising means for controllably varying a lateral refractive index profile of the laser diode across the width of the active lasing region in a sense opposite to the refractive index charge resulting from junction heating and thereby to substantially compensate for an effect of junction heating during the operation of the laser diode and to provide for a single on-axis near-diffraction limited output beam.

4,965,807

ADAPTABLE LASER APPARATUS

Hubert Guillet, Saint Michel Sur Orge, and Dominique Vialle, Villecresnes, both of France, assignors to Micro-Controle, Evry, France

PCT No. PCT/FR88/00426, § 371 Date Mar. 16, 1989, § 102(e) Date Mar. 16, 1989, PCT Pub. No. WO89/02174, PCT Pub. Date Mar. 9, 1989

PCT Filed Aug. 25, 1988, Ser. No. 350,622

Claims priority, application France, Aug. 26, 1987, 8711950

Int. Cl.[5] H01S *3/08, 3/10*

U.S. Cl. 372—92 **14 Claims**

8. A laser apparatus, comprising:

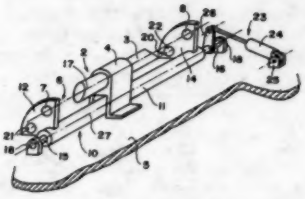
(a) an active medium (2) supported by a support (5) and capable of generating a radiation along an optical axis (17);

(b) a first pair of two reflectors (7, 8), one of said reflectors being disposed on one side of said active medium and the other reflector being disposed on the other side of said active medium;

(c) a second pair of two reflectors (21, 22) one of said reflectors being disposed on one side of said active medium and the other reflector being disposed on the other side of said active medium;

(d) a rotating body (10, 12, 14) arranged on said support (5),

said reflectors (7, 8, 21, 22) of said first and second pairs of reflectors being supported by said rotating body; and



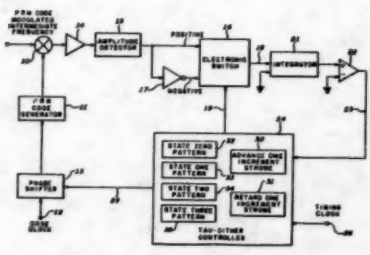
(e) actuating means (23) for bringing one or the other of said first and second pairs of reflectors coaxially into alignment with said active medium.

4,965,808

CODE TRACKING APPARATUS WITH IMPROVED RESOLUTION FOR SPREAD SPECTRUM RECEIVER

Reuben E. Maine, Charlottesville, Va., assignor to Sperry Marine Inc., Charlottesville, Va.

Filed Mar. 1, 1989, Ser. No. 317,393
Int. Cl.[5] H04L 9/00
U.S. Cl. 375—1 **9 Claims**



1. Tau-dither correlation code tracking apparatus for tracking an input code, comprising

code generator means for generating a local code identical to said input code,

a code clock source for providing a code clock,

phase shifter means responsive to said code clock for phase shifting said code clock to provide a shifted code clock with predetermined phase shift increment,

said shifted code clock being applied to said code generator means for clocking said local code,

correlator means responsive to said input code and said local code for correlating said input code with said local code to provide a correlation output in accordance therewith,

tau-dither controller means for providing a sequence of tau-dither phase shift patterns to control said phase shifter means, said patterns having average phase shifts, respectively, with incremental displacements therebetween,

said incremental displacements being smaller than said phase shift increments,

each said phase shift pattern being a series of consecutive increasing and decreasing phase shifts between integral multiples of said predetermined phase shift increments to provide said average phase shift associated therewith,

each said phase shift pattern being differrent from phase shift patterns adjacent thereto in said sequence so as to provide said incremental displacements between said average phase shifts, and

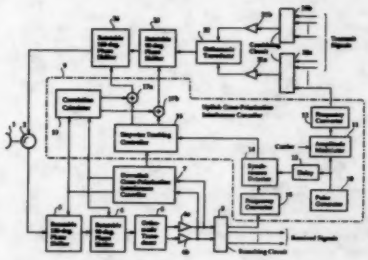
detector means responsive to said correlation outpout for controlling said tau-dither controller to sequentially provide said patterns in accordance with said correlation output.

4,965,809

UPLINK CROSS-POLARIZATION INTERFERENCE CANCELLER USING CORRELATION CALCULATOR AND STEPWISE TRACKING CONTROLLER

Kazuhito Endo, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 28, 1989, Ser. No. 372,671
Claims priority, application Japan, Jun. 29, 1988, 63-161429
Int. Cl.[5] H04B 1/76, 7/10
U.S. Cl. 375—38 **4 Claims**



1. An uplink cross-polarization interference canceller of a satellite communications earth station, the earth station including a rotatable 90° phase shifter and a rotatable 180° phase shifter connected in circuit for introducing variable phase shifts to a pilot signal, means for transmitting said phase-shifted pilot signal to the satellite, means for receiving said pilot signal returning from said satellite, and means for detecting downlink cross-polarization interference cancellation control signals from a beacon signal transmitted from said satellite, comprising:

pulse generator means for generating a pulse sequence;

amplitude modulator means for modulating the amplitude of a carrier with said pulse sequence to produce an ASK signal as said pilot signal;

correlation calculator means for estimating uplink cross-polarization interference components from said downlink cross-polarization cancellation control signals and adjusting the angle settings of said 90° and 180° phase shifters in accordance with the estimated interference components;

synchronous detector means for synchronously detecting the received pilot signal with said pulse sequence and generating a DC signal representative of an uplink cross-polarization interference; and

stepwise tracking control means for stepwisely varying the angle settings of said rotatable 90° and 180° phase shifters by predetermined amounts, detecting previous and recent values of said DC signal resulting from the stepwise variations of said angle settings, and repeating the stepwise variations of said angle settings until a difference between said previous and recent values is substantially reduced to a minimum.

4,965,810

DIGITAL DIFFERENTIAL PHASE-SHIFT KEYED DECODER

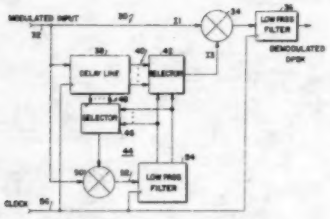
Mark L. Peischl, Wayne, and Relan N. Vinlnan, E. Hanover, both of N.J., assignors to Plessey Electronics Systems Corp., Wayne, N.J.

Filed Nov. 17, 1988, Ser. No. 272,393
Int. Cl.[5] H03D 3/22
U.S. Cl. 375—80 **13 Claims**

1. In a differential phase-shift keyed decoder which receives

a differential phase-shift keyed signal at a carrier frequency, delays the received signal by nominally one bit time, and compares the received signal with the one bit delayed received signal to provide a decoded output data signal, the improvement comprising compensating means for compensating the delay time to account for variations in the carrier frequency, the compensating means including:

tapped delay means having said received signal as an input and having a plurality of output taps providing a plurality of different output tap signals, respectively having different delays relative to said received signal;



selecting means for selecting one of said output tap signals from said plurality of output taps as a reference signal to be used for comparison with and decoding of said received signal; and

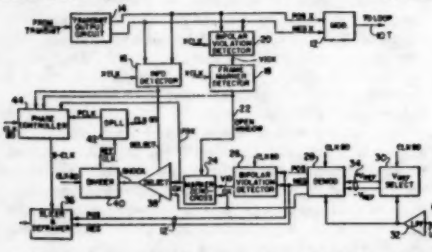
control means for controlling said selecting means to select a predetermined one of said output taps in accordance with a variation in carrier frequency, said control means including means coupled to said delay means for providing a comparison signal related to said reference signal by a fixed phase relationship, and means utilizing said comparison signal to control said selecting means, said control means being in a feedback loop between an output of the selecting means and a control input of the selecting means.

4,965,811

ADAPTIVE TIMING

Thomas C. Sparks, Nepean, Canada, assignor to Bell-Northern Research Ltd., Ottawa, Canada

Filed Jun. 20, 1988, Ser. No. 209,629
Int. Cl.[5] H04L *7/04*
U.S. Cl. 375—109 **47 Claims**



1. Network apparatus for transmitting digital signals to one or more terminal equipments, and for receiving digital signals from such terminal equipments, and for receiving digital signals from such terminal equipments by way of a shared path, both the transmitted digital signals and the received digital signals comprising frames each having a marker, said network apparatus comprising:

I. first means for detecting a marker of a frame of a digital signal transmitted by said network apparatus to said terminal equipment and generating a corresponding marker signal;

II. second means responsive to said marker signal for detecting a received marker of a frame of a digital signal received by said network apparatus from a said terminal equipment and providing a reference signal synchronized to a specific feature of such received marker; and

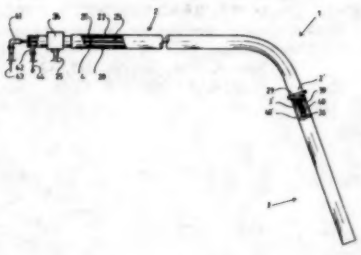
III. third means responsive to said reference signal for sampling said received digital signal at a sampling instant that is determined relative to said specific feature of said received marker.

4,965,812

ELECTRODE FOR A GLASS MELTING

Helmut Sorg, Glattbach; Helmut Pieper, and Rudolf Kessel, both of Lohr/Main, all of Fed. Rep. of Germany, assignors to Sorg GmbH & Co. KG, Lohr/Main, Fed. Rep. of Germany

Filed Nov. 8, 1989, Ser. No. 433,325
Claims priority, application European Pat. Off., Dec. 7, 1988, 88120402
Int. Cl.[5] C03B *5/027*
U.S. Cl. 373—36 **11 Claims**



1. Electrode for a glass melting furnace, comprising:

a metal electrode shaft to be introduced from outside of the glass melting furnace into the interior thereof; and

an electrode body of refractory metal which is joined to the furnace-interior end of the shaft, and is to be mostly immersed in the molten glass in the glass melting furnace, the electrode shaft being of hollow construction and cooled by means of a liquid coolant, and being connectable to an electrical power source, the electrode shaft being a coaxial tube including an inner tube made of a metal constituting a good electrical conductor, and including an outer tube of a mechanically durable, heat-resistant metal.

4,965,813

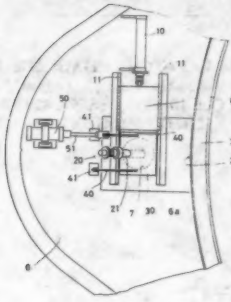
COMBUSTION AIDING APPARATUS FOR STEEL-MAKING ELECTRIC-ARC-FURNACE

Eiji Udo, Kobe, Japan, assignor to Nikko Industry Co., Ltd., Kobe, Japan

Filed Sep. 18, 1989, Ser. No. 408,336
Claims priority, application Japan, Jul. 25, 1989, 1-193237
Int. Cl.[5] H05B *7/00, 11/00*
U.S. Cl. 373—2 **3 Claims**

1. An improved steel making electric-arc-furnace of an eccentric bottom taping type including a furnace bed (1), a furnace side wall (2), a top cover through which heating electrodes extend into said furnace, a plurality of spaced heat aiding burners (9) spaced relative to said heating electrodes, a tapping hole section in said furnace bed, a balcony (6) extending from said furnace side wall (2), an inspection-and-working opening (7) in said balcony and a movable lid (8) for movement relative to said balcony for opening and closing said inspection-and-working opening; the improvement in which said

balcony is provided with a combustion burning (20) having a burner nozzle (21) secured such that said burner nozzle is



freely insertable into and withdrawn from said furnace through said opening (7) in said balcony (6).

4,965,814

SYNCHRONIZER FOR ESTABLISHING SYNCHRONIZATION BETWEEN DATA AND CLOCK SIGNALS

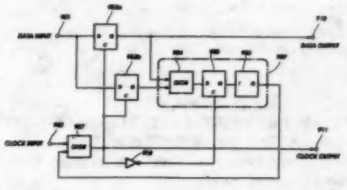
Norio Yoshida, and Hiroshi Shimizu, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jan. 23, 1989, Ser. No. 299,488

Claims priority, application Japan, Jan. 21, 1988, 63-11943; Mar. 14, 1988, 63-60888; Mar. 14, 1988, 63-60889; May 18, 1988, 63-122555

Int. Cl.[5] H04L *7/06*

U.S. Cl. 375—111 **16 Claims**



8. A synchronizer for establishing synchronization between a data signal applied to a data input terminal and a clock signal applied to a clock input terminal, comprising:

a plurality of latch means connected to said data input terminal and said clock input terminal for respectively latching said data signal in response to said clock signal;

mismatch detector means for detecting a mismatch between output signals of said plural latach means; and

phase reversal means for reversing the phase of said clock signal in response to the detection of said mismatch.

4,965,815

PHASE DETECTION CIRCUIT FOR STEPWISE MEASUREMENT OF A PHASE RELATION

Arnoldus J. J. Boudewijns, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

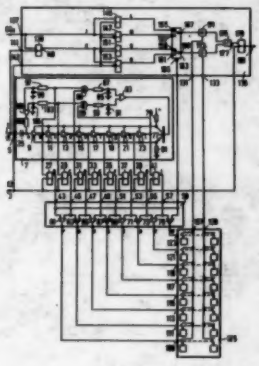
Filed Jun. 21, 1989, Ser. No. 369,568

Claims priority, application Netherlands, Jul. 21, 1988, 8801845

Int. Cl.[5] H04L *7/00*

U.S. Cl. 375—119 **4 Claims**

1. A phase detection circuit for stepwise measurement of a phase relation between two clock signals, comprising a delay circuit controllable by a first one (f_1) of the two clock signals, said delay circuit having a plurality of tappings each being coupled to an input of a different one of a plurality of memory elements, a clock signal input of each of the memory elements is controllable by the second one (f_2) of the two clock signals and an output of each of the memory elements is coupled to a logic circuit for determining the phase relation to be measured, an output combination of said logic circuit indicating the phase relation between said two clock signals, while a measuring circuit for determining the period of the first clock signal is



coupled to a plurality of outputs of the delay circuit, characterized in that the logic circuit includes a group of gate circuits alternately having an AND function and a NOR function arranged each time between similar outputs of two successive memory elements and in that the measuring circuit comprises two EXCLUSIVE-OR gate circuits each being coupled to a pair of outputs of the delay circuit and having their outputs coupled to a control circuit for controlling the delay time of the delay circuit in such a way that it corresponds to the period of the first clock signal.

4,965,816

DIGITAL LOGIC CIRCUIT FOR INCREMENTAL ENCODERS

Liang Shih, Rochester, and Clifford L. Skillings, Brockport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 5, 1989, Ser. No. 361,065

Int. Cl.[5] H03D *13/00;* **H03K** *21/02;* **G06M** *3/02*

U.S. Cl. 377—17 **6 Claims**

1. A digital logic circuit for receiving a pair of quadrature phased pulse train signals indicative of position and direction of an associated member comprising:

a pair of serially connected NAND and OR gates each receiving one of said quadrature phased pulse train signals for providing a two gate delay signal;

a pair of exclusive-NOR gates each receiving one of said two gate delay signals with one of said quadrature phased pulse train signals to provide said pair of edge signals;

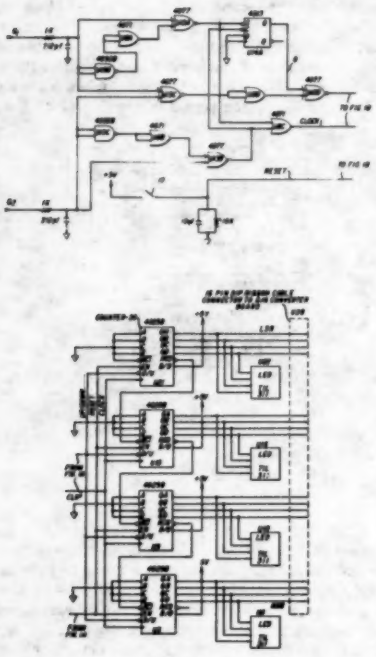
an OR gate for combining said provided pair of edge signals from said pair of logic means to provide a CLOCK signal;

means for receiving said pair of quadrature phase pulse train signals and said pair of edge signals from said pair of exclusive-NOR gates for converting said signals to an UP/DOWN count signal;

means for providing a RESET signal; and

counter means for receiving said CLOCK signal, said UP/-DOWN count signal, and said RESET signal, for providing output count signals in accordance with the CLOCK

signal, in a direction determined by said UP/DOWN count signal, for a duration determined by said RESET signal, indicative of the direction and position of the associated member.



4,965,817

DEVICE FOR THE MEASUREMENT OF AN EVENT

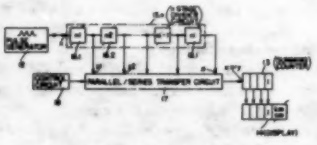
Georg Angele, Remchingen, Fed. Rep. of Germany, assignor to Borg Instruments GmbH, Remchingen, Fed. Rep. of Germany

Filed Jan. 19, 1988, Ser. No. 145,096

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1987, 3702991

Int. Cl.[5] G01D *5/245*; H03K *21/00*; G01C *22/02*

U.S. Cl. 377—19 **3 Claims**



1. A measuring circuit for an event which is to be measured and characterized by a series of measuring pulses, including a divider circuit comprising a series of counter stages for counting the measuring pulses, wherein said counter stages are individually settable to different counting values at which they produce an overflow, with the first counter stage receiving the measuring pulses as an input, and each subsequent counter stage receiving the overflow output of the previous counter stage, a summing counter for counting the overflow outputs of all of the counter stages, which are transferred thereto by a transfer circuit coupled between the input of said summing counter and the overflow outputs of the counter stages of said divider circuit.

4,965,818

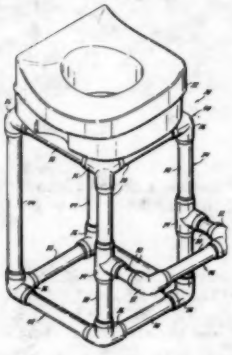
RADIOSCOPIC LAVATORY CHAIR AND METHOD

Timothy L. Savage, 4536 Garwood St., Ladson, S.C. 29456

Filed Oct. 10, 1989, Ser. No. 420,770

Int. Cl.[5] H05G *1/00*

U.S. Cl. 378—208 **18 Claims**



16. An improved method of radioscopic imaging of defecation dysfunction of a patient comprising the steps of:

providing a seat to support the patient during the imaging;

adjusting the radiopacity of the seat to approximate the radiopacity of the patient;

making radioscopic images of the patient while the patient is supported on the seat.

4,965,819

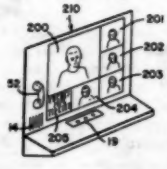
VIDEO CONFERENCING SYSTEM FOR COURTROOM AND OTHER APPLICATIONS

Deno Kannes, San Francisco, Calif., assignor to Docu-Vision, Inc., San Francisco, Calif.

Filed Sep. 22, 1988, Ser. No. 247,904

Int. Cl.[5] H04M *11/00*; H04N *7/15*

U.S. Cl. 379—53 **19 Claims**



1. An interactive video conferencing system for use by at least two local conferees, including:

a video camera for each conferee, wherein each video camera generates a video signal;

a picture in picture video monitor, having a large picture area and a small picture area;

a composite video signal generation unit connected to each video camera and to the monitor, for receiving video signals from the video cameras, sending a principal one of the video signals to the monitor for display in the large picture area, and sending each of the other video signals to

the monitor for display in a distinct region of the small picture area;

a microphone for each conferee, wherein each microphone generates a microphone signal; and

video signal selection means for receiving the microphone signals, identifying an active one of the microphone signals, and sending a control signal to the composite video signal generation unit, wherein the control signal identifies said principal one of the video signals, and said principal one of the video signals corresponds to the active microphone signal.

8. An interactive video conferencing system for use by at least a first conferee in a local module and a second conferee in a remote module, including:

a first video camera positioned in the local module and aimed at the first conferee, for generating a first video signal representing an image of the first conferee;

a video monitor positioned in the remote module for receiving the first video signal and displaying the image of the first conferee;

a partially reflecting mirror positioned in the remote module and a substantially transparent screen positioned in the remote module relative to the video monitor so that the mirror reflects the image of the first conferee through the screen, and so that the second conferee may view the reflected image of the first conferee through the screen;

a second video camera positioned in the remote module and aimed at the screen and positioned relative to the mirror so that when the second conferee views the reflected image of the first conferee through the screen, light reflected from the second conferee will propagate through the screen and the mirror to the second video camera;

a third video camera in the local module for generating a third video signal representing an image of a third conferee, wherein the monitor displays a composite video signal having component signals including the first video signal and the third video signal; and

a means for supplying a video prompt to the monitor, in a manner so that the video prompt is another component video signal of the composite video signal.

4,965,820

CELLULAR TELEPHONE APPARATUS

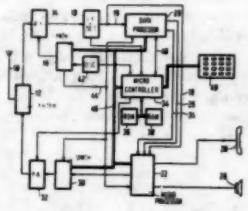
Robin Sharpe, Morden; Peter Hart, Addington, both of United Kingdom, and Petrus P. Van de Mortel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 1, 1988, Ser. No. 265,648

Claims priority, application United Kingdom, Nov. 2, 1987, 8725626

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—59 **12 Claims**



1. A cellular telephone apparatus comprising:

a duplex transceiver;

a logic unit comprising a data processor operable at a first clock frequency coupled to the transceiver for processing data received by or to be transmitted by the transceiver and a microcontroller operable at a second clock frequency higher than said first clock frequency coupled to the data processor for utilizing data produced by the data processor and for providing data to the data processor by the transceiver for transmission;

a clock generator for supplying a first clock signal to the microcontroller; and

means coupled to said clock generator for generating a second clock signal which is supplied to the data processor, the second clock signal being of lower frequency than, and in synchronism with, the first clock signal.

4,965,821

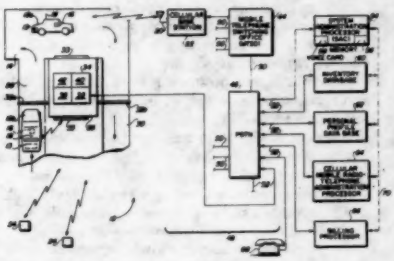
CELLULAR MOBILE RADIOTELEPHONE-BASED SYSTEM FOR RENTAL OF MOBILE EQUIPMENT

Ronald D. Bishop, and Paul Hoberg, both of Mission Viejo,, Calif., assignors to GTE Mobilnet Incorporated, Houston, Tex.

Filed Dec. 23, 1988, Ser. No. 289,079

Int. Cl.[5] H04M *1/57*; H04Q *7/04*

U.S. Cl. 379—91 **42 Claims**



1. A system for generating written documents for the rental of equipment having a cellular mobile radiotelephone (CMR) with a keypad and having a card reader coupled to said CMR, said CMR being coupled to a communications network, and said system comprising:

a transient use processor (TUP) coupled to said CMR and to said card reader, said TUP being programmed to:

(a) obtain identification information from a programmed card read by said card reader,

(b) obtain a first set of contract parameters entered from said keypad, and

(c) cause said CMR to transmit, through said communications network, said identification information and said first set of contract parameters;

a printing device coupled to said communications network;

a memory device configured to include a personal profile database; and

a system administration computer (SAC), coupled to said communications network and in data communication with said memory device, said SAC being programmed to:

(a) send, through said communications network to said CMR, voice prompts intended to request specific ones of said first set of contract parameters,

(b) receive said identification information and said first set of contract parameters from said communications network,

(c) obtain, from said personal profile database, a second set of contract parameters, and

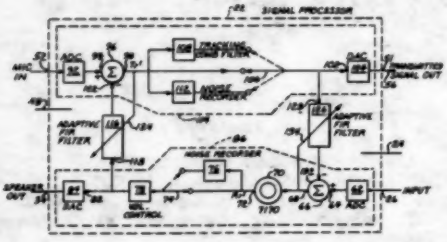
(d) send, to said printing device, said first and second sets of contract parameters for printing a written contract form at said printing device.

4,965,822

FULL DUPLEX SPEAKERPHONE

Errol R. Williams, Austin, Tex., assignor to VideoTelecom Corp., Austin, Tex.

Filed Apr. 10, 1989, Ser. No. 335,239
Int. Cl.[5] H04M *1/60, 9/08*
U.S. Cl. 379—390 23 Claims



1. A full duplex speakerphone for simultaneously:
receiving and transmitting signals over a telephone line comprising:
(a) a microphone for converting audible communications to be transmitted into a microphone output signal;
(b) a speaker for converting a received signal into an audible communication; and
(c) means for signal processing both the received signal and the microphone output signal, said signal processing means including:
i. a received signal processing path including a first summing junction having a first input to which the received signal is coupled, said first summing junction transmitting an output signal to said speaker;
ii. a transmitted signal processing path including a second summing junction having a first input to which the microphone output signal is coupled;
iii. a tracking comb filter means included in said transmitted signal processing path, for attenuating the portion of the microphone output signal resulting from speaker feedback;
iv. near side echo canceling means for receiving the output signal from said first summing junction, and producing an output signal supplied as a second input signal to said second summing junction, said output signal being combined with the microphone output signal at said second summing junction to minimize echo; and
v. far side echo canceling means for receiving the filtered signal transmitted from said tracking comb filter and producing an output signal supplied as a second input signal to said first summing junction, said output signal being combined with the received signal at said first summing junction to minimize echo in the received signal.

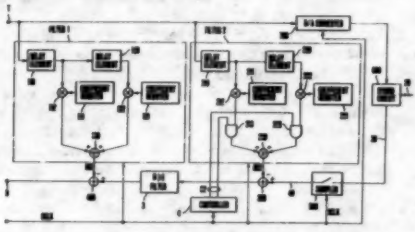
4,965,823

ECHO CANCELLER

Fujio Nakagawa, and Akira Kanemasa, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 7, 1988, Ser. No. 267,891
Claims priority, application Japan, Nov. 6, 1987, 62-281331
Int. Cl.[5] H04M *1/00*
U.S. Cl. 379—411 2 Claims

1. An echo canceller for canceling an echo signal which results from 2-wire/4-wire conversion and is sampled by a sampler, comprising:
a filter connected with an output of said sampler;
a first transversal filter which has the coefficients representing the echo path response wave at fixed sampling timing and generates a first echo canceling signal;
a first subtracting means which subtracts said first echo canceling signal from an output of said filter connected with said sampler;
a second transversal filter which has the coefficients representing the deviation of the sampled value of the echo path response wave and generates a second echo canceling signal;
a second subtracting means which subtracts said second echo canceling signal from said output of said sampler;



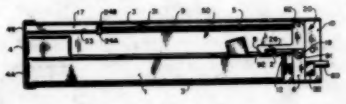
enable/disable means for enabling/disabling a tap output of said second transversal filter; and
controller means for, from a moment at which a sampling clock is jittered, controlling said enable/disable means, using a control signal, for canceling the deviation of sampled echo signal.

4,965,824

PAY STATION TELEPHONE AND DISPENSER FOR A COMMERCIAL CONVEYANCE

Edward J. Hollowed, Naperville, and Jerome L. Oldani, Aurora, both of Ill., assignors to GTE Airfone Incorporated, Oak Brook, Ill.

Filed Feb. 27, 1989, Ser. No. 278,392
Int. Cl.[5] H04M *1/11, 17/02*
U.S. Cl. 379—428 27 Claims



1. In combination:
a hand-held telephone and latch receiver (2);
an elongated, substantially enclosed telephone dispenser including a telephone receiving cavity adapted to receive said telephone in response to the manual placement of said telephone within said cavity;
a latch (20) operable to automatically engage said latch receiver to maintaining said telephone within said telephone receiving cavity; and
means for mounting said telephone dispenser to the armrest of a passenger seat of a vehicle.

4,965,825

SIGNAL PROCESSING APPARATUS AND METHODS

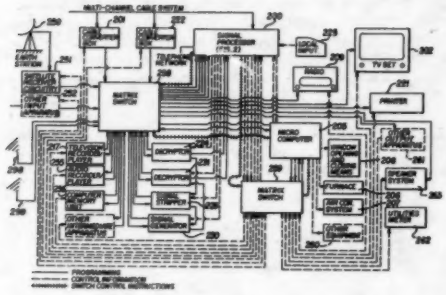
John C. Harvey, and James W. Cuddihy, both of New York, N.Y., assignors to The Personalized Mass Media Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 829,531, Feb. 14, 1986, Pat. No. 4,704,725, which is a continuation of Ser. No. 317,510, Nov. 3, 1981, Pat. No. 4,694,490. This application Sep. 11, 1987, Ser. No. 96,096
Int. Cl.[5] H04L *9/00*; G06F *15/21*
U.S. Cl. 380—9 25 Claims

20. A method of generating computer output at a multiplic-

ity of receiver stations each of which includes a computer adapted to generate and transmit user specific signals to one or more associated output devices, with at least some of said computers being programmed to process modification control signals so as to modify said computers' method of processing data and generating output information content, each of said computers being programmed to accommodate a special user application, comprising the steps of:

transmitting an instruct-to-generate signal to said computers at a time when corresponding user specific output information content does not exist,



detecting the presence of said instruct-to-generate signal at selected receiver stations and coupling said instruct-to-generate signal to the computers associated with said selected stations, and

causing said last named computer to generate their user specific output information content in response to said instruct-to-generate signal, thereby to transmit to each of their associated output devices an output signal comprising the user specific output information content and the user specific signal of its associated computer, the output signals at a multiplicity of said output devices being different, with each output signal specific to a specific user.

4,965,826

METHOD OF AND SYSTEM FOR SCRAMBLING/DESCRAMBLING SOUND

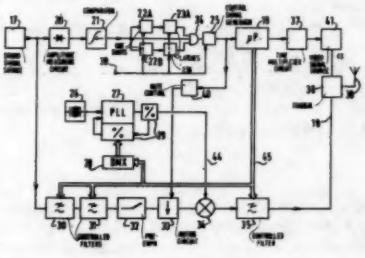
Vincent Caprarese, Bois Colombes, and Didier Goguillon, Fourqueux, both of France, assignors to U.S. Philips Corporation, N.Y.

Filed Dec. 20, 1988, Ser. No. 288,060

Claims priority, application France, Dec. 23, 1987, 87 18045

Int. Cl.[5] H04K *1/00*

U.S. Cl. 380—19 **10 Claims**



5. A system for transmitting an output audio signal which is a scrambled version of an input audio signal by swtiching among a plurality of scrambling modes, comprising:

comparison means for comparing the amplitude of the input audio signal with a reference level below which "silence" occurs and for forming an output signal indicating when said amplitude is below said reference level, *means for checking the output signal of the comparison means during a detection period to detect a sustained "silence" throughout said detection period, and for generating a control signal when said sustained "silence" is detected,

means for transmitting said control signal through a transmission channel means,

a processor fed by the control signal for changing a current scrambling mode in response to said control signal and for determining a digital control value indicating in which way the input audio signal must be altered in accordance with the current scrambling mode,

means responsive to said digital control value for forming said output audio signal by altering said input audio signal and for transmitting said output audio signal in said transmission channel means, and ** means for delaying the transmitted output audio signal with respect to the transmitted control signal for at least a predetermined period or for muting said transmitted output audio signal for said predetermined period immediately after the appearance of said control signal.

4,965,827

AUTHENTICATOR

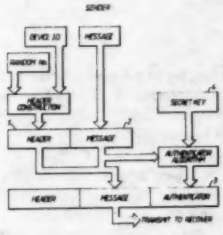
Neil A. McDonald, Witham, United Kingdom, assignor to The General Electric Company, p.l.c., London, United Kingdom

Filed May 18, 1988, Ser. No. 195,323

Claims priority, application United Kingdom, May 19, 1987, 8711743

Int. Cl.[5] H04L *9/00*

U.S. Cl. 380—25 **12 Claims**



1. In an electronic transaction system, comprising: a host computer including means for generating an authentication code for a digital signal message wherein the authentication code is to be appended to the message without altering the digital signal constituting the message; a reading device connected to the host computer; and a portable token having memory storage means, micro-controller means and means for data transmission and reception, the micro-controller also having means for generating the authentication code; the host computer and the micro-controller communicating so as to pass digital signal messages therebetween; wherein the authentication code is generated according to a method comprising:

generating, in at least the host computer, a numerical array;

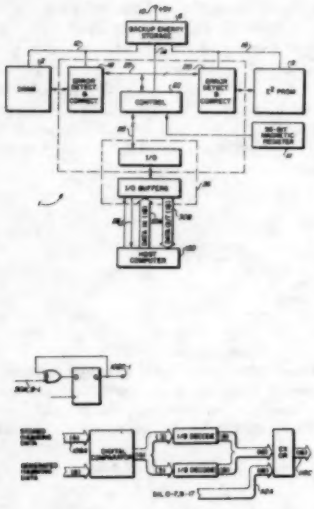
using in at least the host computer a key to controllably shift the relative positions of each element within the array to form a scrambled array; and applying the scrambled array to the message to provide an authentication code for that message, in the host computer and the microcontroller.

4,965,828

NON-VOLATILE SEMICONDUCTOR MEMORY WITH SCRAM HOLD CYCLE PRIOR TO SCRAM-TO-E²PROM BACKUP TRANSFER

Harold L. Ergott, Jr., Fountain Hills; John F. Bruder, Phoenix; Robert E. Peters, and Sam L. Rainwater, both of Tempe, all of Ariz., assignors to Quadri Corporation, Chandler, Ariz.

Filed Apr. 5, 1989, Ser. No. 333,709
Int. Cl.[5] H04L 9/00; G11B 23/28
U.S. Cl. 380—50 24 Claims



1. A method of operating a non-volatile memory system to prevent excessive downloading of data from a volatile SRAM into an E²PROM in response to short duration power interruptions, comprising the steps of:

(a) writing data into the SRAM by means of a host computer, and then performing read and/or write memory accesses to the SRAM while an external power supply voltage is applied to the non-volatile memory system;

(b) charging a backup capacitor to a selected voltage level and maintaining the selected voltage level while the external power supply voltage is applied to the non-volatile memory system;

(c) halting accessing of the SRAM by the host computer while discharging the backup capacitor to supply energy to maintain a data maintenance voltage on the SRAM if the external power supply voltage falls below a first threshold;

(d) resuming accessing of the SRAM by the host computer if the external power supply voltage rises above the first threshold before the backup capacitor voltage falls below a second threshold;

(e) downloading all of the data in the SRAM to the E²-PROM while discharging the backup capacitor to supply energy to maintain an internal power supply voltage necessary for the downloading if the backup capacitor voltage falls below the second threshold,

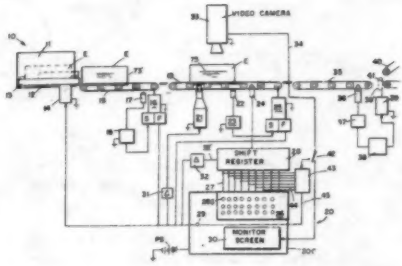
the backup capacitor storing enough energy when the backup capacitor voltage is at the selected level to both effectuate the downloading and allow the halted condition to continue for at least a preselected time.

4,965,829

APPARATUS AND METHOD FOR CODING AND READING CODES

Jerome H. Lemelson, 48 Parkside Dr., Princeton, N.J. 08540

Continuation-in-part of Ser. No. 686,908, Dec. 27, 1984, Pat. No. 4,675,498, which is a continuation of Ser. No. 968,216, Dec. 11, 1978, abandoned, which is a continuation of Ser. No. 667,255, Mar. 16, 1976, abandoned, which is a continuation of Ser. No. 506,887, Sep. 17, 1974, abandoned, Continuation-in-part of Ser. No. 157,574, Jun. 28, 1971, abandoned, which is a continuation-in-part of Ser. No. 665,526, Sep. 5, 1967, Pat. No. 3,587,856, which is a continuation-in-part of Ser. No. 215,210, Aug. 6, 1962, abandoned, which is a continuation-in-part of Ser. No. 968,216, Dec. 11, 1978, which is a continuation-in-part of Ser. No. 498,953, Aug. 20, 1974, which is a continuation-in-part of Ser. No. 157,573, Jun. 28, 1971, abandoned. This application Jun. 23, 1987, Ser. No. 65,379
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—1 12 Claims



1. A method of recording information on a series of discrete objects comprising the steps of:

moving through a moving means series of discrete objects, some of which may be spaced apart from each other;

providing means for moving a series of discrete objects for generating intense radiation for recording information on an object, said means for generating intense radiation acting to selectively generate radiant energy in the form of a pulsed radiant energy beam;

detecting through detecting means the presence of an object to have information recorded thereon in a predetermined relationship to said means for generating intense radiation;

generating through information generating means information to be recorded on an object in response to a detection of said presence of said object in said predetermined relationship to said means for generating;

translating through information translating means said information into a digital pulse code; and

gating through gating means said means for generating intense radiation with said digital pulse code to cause same means for generating intense radiation to record information on said discrete object.

4,965,830

APPARATUS FOR ESTIMATING DISTORTION RESULTING FROM COMPRESSING DIGITAL DATA

Steven T. Barham, Salt Lake City, and Michael J. Hurst, West Jordan, both of Utah, assignors to Unisys Corp., Blue Bell, Pa.

Filed Jan. 17, 1989, Ser. No. 297,273
Int. Cl.[5] G10L 7/02
U.S. Cl. 381—31 11 Claims

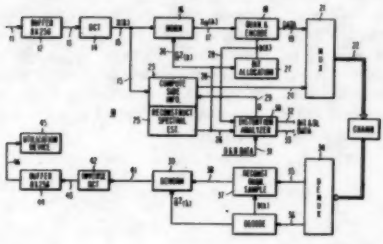
1. Apparatus for calculating distortion levels resulting from compressing frames of digital data in a data compression system of the type having a transform device for generating trans-

form coefficients X(k) of digital bit samples corresponding to a frame of digital data, said apparatus comprising:

processing means,

coupling means for coupling said processing means to said data compression system to provide bit data B, bit allocation data b(k) and power level data $H^2(k)$ for each transformed coefficient X(k),

storage means coupled to said processing means for supplying predetermined unique quantization error values M(k) for each transformed coefficient X(k),



said processor means having program means for calculating estimated distortion values D(k) for each transform coefficient X(k) where D(k) is equal to said power level data H^2 (k) times said quantization error value M(k), and

means for summing a plurality of individual estimated distortion values D(k) to provide an average distortion level value DL for a frame of digital data being compressed using B bits.

4,965,831

HEARING AID HOUSING WITH RETAINING FRAME

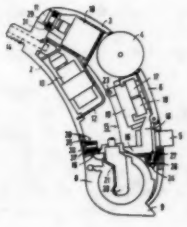
Erich Schmid, Schwaig, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 27, 1988, Ser. No. 249,497

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1987, 8713086

Int. Cl.[5] H04R *25/00*

U.S. Cl. 381—69 **6 Claims**



1. A hearing aid having a housing to be worn behind the ear, said hearing aid comprising at least two housing shells and hearing aid structural components located therein, said hearing aid structural components including a microphone, a power source, a receiver and an amplifier structure, said amplifier structure being held together with mounting means and comprising individual component parts including a hearing coil and an actuator arrangement, and wherein the hearing aid comprises a retaining frame as at least part of said mounting means for holding at least the amplifier structure with its individual component parts and also for holding the two housing shells together.

4,965,832

ACTIVE NOISE CONTROL

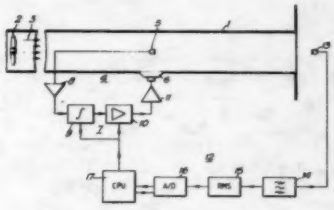
John W. Edwards, Middlesex, and Nicolaas M. J. Dekker, Midhurst, both of United Kingdom, assignors to The General Electric Company, p.l.c., England

Filed Apr. 25, 1989, Ser. No. 342,315

Claims priority, application United Kingdom, Apr. 29, 1988, 8810236.3

Int. Cl.[5] G10K *11/16*

U.S. Cl. 381—71 **10 Claims**



1. An active noise control system, comprising:

(a) a duct through which noise to be controlled can propagate from a noise source;

(b) first receiving transducer means located to receive the propagated noise at a point in a plane perpendicular to the length of the duct;

(c) transmitting transducer means located substantially at said plane for introducing sound into the duct;

(d) analog first control means connected in a feedback loop with said first receiving transducer means and said transmitting transducer means and operative, in response to the noise received by said first receiving transducer means, for feeding a signal to the transmittng transducer means such that the sound introduced thereby destructively interferes with the noise at said point, said first control means including integrating circuit means having an electrically-controllable transfer function;

(e) second receiving transducer means located further from the noise source than said plane to receive residual noise propagated along the duct despite said destructive interference; and

(f) second control means, responsive to the residual noise received by said second receiving transducer means, for controlling parameters of said first analog control means so a to minimize said residual noise.

4,965,833

VOICE ENHANCER SYSTEM

Thomas McGregor, West Lodge, Balmuto, Kirkcaldy, Fife KY2 5XA; George A. Wemyss, Baltilly Lodge, Ceres, Fife KY15 5QG, and Ian M. Firth, Anworth Cottage, Giffordtown, Fife, all of Scotland

Filed Aug. 16, 1988, Ser. No. 232,800

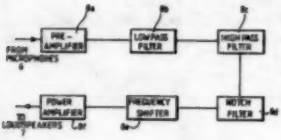
Claims priority, application United Kingdom, Aug. 19, 1987, 8719624; May 25, 1988, 8812434

Int. Cl.[5] H04R *27/00*

U.S. Cl. 381—83 **15 Claims**

1. A voice enhancer system for a motor vehicle, the system comprising at least one microphone connected to at least one loud speaker by a multi-component amplifier/electrical conditioning unit, wherein the components of the amplifier/electrical conditioning unit include a low pass filter, a high pass filter,

a notch filter and a frequency shifter, said frequency shifter constituting means for shifting the frequency of sounds prior to



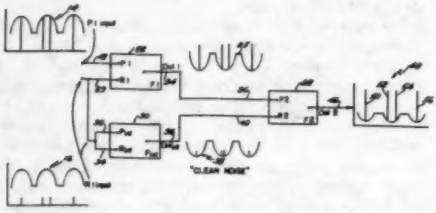
the sound being transmitted through the loud speaker whereby acoustical 'howl-around' is prevented.

4,965,834

MULTI-STAGE NOISE-REDUCING SYSTEM

Harry B. Miller, Niantic, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 20, 1989, Ser. No. 328,651
Int. Cl.[5] H04B *15/00*
U.S. Cl. 381—94 **8 Claims**



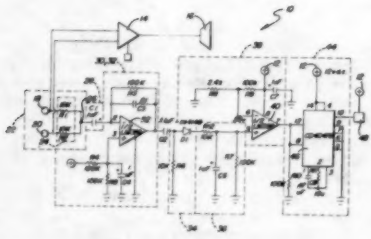
1. An electronic noise-reducing system, wherein the noise comes from a nearfield noise source, utilizing a plurality of adaptive filters, including a final filter, fed by at least two sensors, namely a reference sensor comprising at least two electroacoustic elements, and an omnidirectional primary sensor, wherein at least one electroacoustic element of the reference sensor is used both in the reference sensor and simultaneously in the primary sensor; and wherein only the output of the final filter is used as the output of the system.

4,965,835

SIGNAL SENSING CIRCUIT

Peter A. Hochstein, 2966 River Valley Dr., Troy, Mich. 48098

Filed Jun. 1, 1989, Ser. No. 359,955
Int. Cl.[5] H03G *3/20*
U.S. Cl. 381—110 **19 Claims**



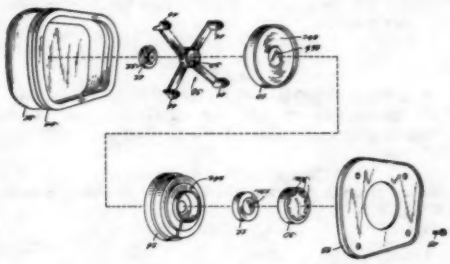
1. A signal sensing assembly for sensing audio signals and supplying power to a device in response thereto, said assembly comprising; input means (22) for supplying an audio signal, coupling means (C1) for eliminating dc components from the audio signal; input filter and amplifier means (32) for receiving said audio signal from said coupling means (C1) and amplifying said audio signal while attenuating frequency components above a first predetermined frequency producing a filtered signal, rectifier means (34) for receiving and rectifying said filtered signal to produce a level signal, comparator means (38) for receiving said level signal and comparing said level signal to a predetermined magnitude to produce a trigger signal, timer means (44) for receiving said trigger signal and producing a control signal for a predetermined time in response to said trigger signal, said timer means comprising a (44) retriggerable monostable (46) for producing said control signal for said predetermined time and for restarting said predetermined time in response to a subsequent reception of said trigger signal, and control means (48) for receiving said control signal to supply power to the device (14).

4,965,836

STEREO HEADPHONE

Eugene M. Andre, Port Washington; Allan G. Modzikowski, Milwaukee, and Seth R. Banks, Glendale, all of Wis., assignors to Koss Corporation, Milwaukee, Wis.

Filed Jan. 19, 1989, Ser. No. 299,878
Int. Cl.[5] H04R *1/10*
U.S. Cl. 381—183 **9 Claims**



1. A headphone having a dual element speaker unit comprising, in combination:

a face plate having an opening generally centrally located therein;

a case coupler mounted in said opening, and having an annular projection protruding therethrough;

a first dynamic acoustic transducer mounted within said annular projection of said case coupler;

a second dynamic acoustic transducer mounted to said case coupler opposite said first transducer, between said first and second transducer for sonically isolating said first transducer from said second transducer.

8. A headphone comprising, in combination:

a face plate having an opening generally centrally located therein;

a case coupler mounted in said opening, and carrying a plurality of acoustic transducers;

a cup assembly; and

a support assembly for supporting said face plate and said case coupler with respect to said cup assembly and allowing relative pivoting movement between said cup assembly and said face plate, said support assembly including a ball and socket arrangement resulting in relative motion being permitted between said cup assembly and said face plate, and wherein said relative motion is biaxial.

4,965,837

ENVIRONMENTALLY RESISTANT LOUDSPEAKER

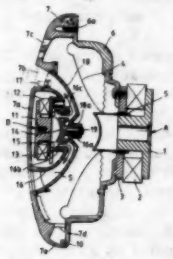
Fumio Murayama, and Yoshiaki Homma, both of Yamagata, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 31, 1989, Ser. No. 429,916

Claims priority, application Japan, Dec. 28, 1988, 63-328812; Dec. 28, 1988, 63-328813

Int. Cl.[5] H05K 5/00

U.S. Cl. 381—186 6 Claims



1. A loudspeaker comprising:

woofer means;

grille means attached to the front of said woofer means;

tweeter means attached to said grille means in such a manner that said tweeter means and said woofer means face in mutually opposite directions; and

wherein a communication space is defined between said tweeter means and said grille means to direct sound from said tweeter means in the same direction as sound from said woofer means.

4,965,838

EAR PIECE TRANSDUCER

Yoshiyuki Kamon, Kanagawa, and Makoto Yamagishi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 30, 1989, Ser. No. 375,144

Claims priority, application Japan, Jul. 12, 1988, 63-092401[U]

Int. Cl.[5] H04R 1/10

U.S. Cl. 381—187 16 Claims

1. An ear piece transducer comprising:

(a) a housing incorporating therein an electroacoustic transducer element, said housing being formed such that it is inserted into a concave portion of an auricle; and

(b) an annular ring member attached to the outer peripheral portion of said housing, said annular ring member being formed of varying annular width thickness such that it is widest in one radial direction from the center of said housing, whereby at least a portion of said annular ring member is made of a resilient material.

4,965,839

ELECTRO ACOUSTIC TRANSDUCER AND LOUDSPEAKER

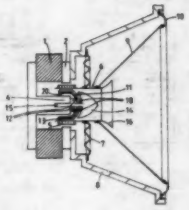
Boaz Elieli, 6, Patricia Close, West End, Southampton, Hampshire, SO3 3SP, England

Filed Jun. 2, 1989, Ser. No. 360,374

Claims priority, application United Kingdom, Jun. 2, 1988, 8813001; Jan. 27, 1989, 8901786

Int. Cl.[5] H04R 9/00

U.S. Cl. 381—195 11 Claims



1. An electro acoutic transducer comprising: a magnetic circuit including a first pole piece and a second pole piece defining therebetween a magnetic gap; a coil former; a coil for receiving electrical power for driving said transducer, said coil being wound on said coil former and being located at least partly in said magnetic gap; an acoustic radiating element having a skirt of electrically conductive material forming a shorted turn extending into said magnetic gap inside said coil, said acoustic radiating element being mechanically independent of said coil and said shorted turn being inductively coupled to said coil; and a fixed member located in front of said acoustic radiating element, said coil former extending forward of said acoustic radiating element and said fixed member being located at least partially within said coil former and having an end which faces said acoustic radiating element and which defines with said coil former an annular primary passage for exit of acoustic radiation generated by said acoustic radiating element.

4,965,840

METHOD AND APPARATUS FOR DETERMINING THE DISTANCES BETWEEN SURFACE-PATCHES OF A THREE-DIMENSIONAL SPATIAL SCENE AND A CAMERA SYSTEM

Muralidhara Subbarao, Port Jefferson Station, N.Y., assignor to State University of New York, Albany, N.Y.

Filed Nov. 27, 1987, Ser. No. 126,407

Int. Cl.[5] G06K 9/00

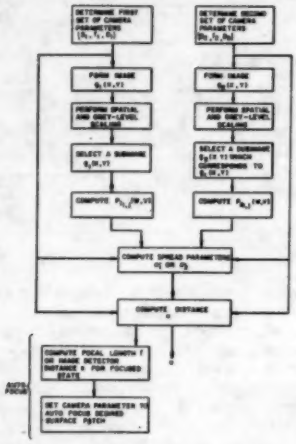
U.S. Cl. 382—1 26 Claims

1. A method of determining the distance between a surface patch in a three-dimensional spatial scene and a camera system which includes an image forming system, said camera system characterizable by a point spread function having a spread parameter and by three camera parameters, one or more of which can be set to a different camera parameter value during the image formation process and all of which are quantifiably determinable to provide a first and second set of camera parameters which have at least one dissimilar camera parameter value, said method comprising:

(a) forming a first two-dimensional image of said three-dimensional spatial scene using said camera system characterized by a first set of camera parameters and a first spread parameter of said point spread function;

(b) forming a second two-dimensional image of said three-dimensional spatial scene using said camera system characterized by a second set of camera parameters and a second spread parameter of said point function, said first and second set of camera parameters having at least one dissimilar camera parameter value;

(c) selecting from said first and second two-dimensional images, a first and a second subimage, respectively, which correspond to the surface patch of said three-dimensional spatial scene, the distance from which to said camera system is to be determined;
(d) on the basis of said first and second subimages, deriving a first constraint between said spread parameters;
(e) deriving a second constraint between said spread parameters on the basis of the values of said first and second set of camera parameters;



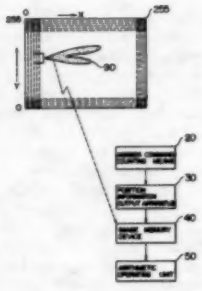
(f) determining said spread parameters using said first and second constraints derived in steps (d) and (e), respectively; and
(g) on the basis of at least one of said spread parameters determined in step (f) and said first and second set of camera parameters, determining the distance between said camera system and the surface patch in said three-dimensional spatial scene.

4,965,841

LUMINANCE CUMULATIVE INTEGRATING METHOD AND APPARATUS IN IMAGE PROCESSES

Yasuhiro Kaneko, Kariya, and Shinzo Ito, Aichi, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 881,322, Jul. 2, 1986, abandoned. This application Oct. 4, 1988, Ser. No. 253,960
Claims priority, application Japan, Jul. 5, 1985, 60-148944
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—1 **14 Claims**



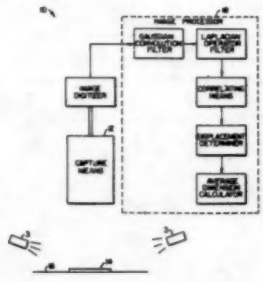
1. An image processing system, including an image sensor which is sensitive to an image of an object, for performing a cumulative integrating processing of a luminance of at least one block region to be measured within the image, in accordance with a luminance of the image obtained by said image sensor, comprising:
image memory means, coupled to the image sensor, for storing a luminance of each pixel constituting the image obtained by said image sensor as luminance data, at an address corresponding to a position of said each pixel on said image;
a microcomputer for specifying addresses of said image memory means corresponding to positions on said image of each pixel constituting said at least one block region to be measured;
address output means for storing said addresses specified by said microcomputer, and for outputting said address data corresponding to an input count data to said image memory means;
count generating means for sequentially producing said count data to said address output means by counting up or down said count data in a predetermined direction to address said address output means to sequentially output address data to said image memory means; and
arithmetic operating means for sequentially adding the luminance data outputted by said image memory means in correspondence with said address data outputted by said address output means.

4,965,842

METHOD AND ATUS FOR MEASURING FEATURE DIM... IS USING CONTROLLED DARK-FIELD ILLUMINATION

P. A. Crossley, Palo Alto, and H. Keith Nishihara, Los Altos, both of Calif., assignors to Schlumberger Technologies, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 888,535, Jul. 22, 1986, abandoned. This application Dec. 14, 1987, Ser. No. 132,528
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—8 **16 Claims**



1. A method for measuring an average feature dimension of a target, the target comprising a plurality of elements, the method comprising the steps of:
illuminating the target from a first direction to scatter light from a first edge of each of the elements;
capturing a first image by collecting and focusing the light scattered from the first edges;
digitizing the captured first image;
illuminating the target from a second direction to scatter light from a second edge of each of the elements;
capturing a second image by collecting and focusing the light scattered from a second edges;
digitizing the captured second image;
correlating the first image with the second image for a selected set of relative image displacements to generate a set of correlation values having a peak value associated with

a particular relative displacement of the first and second images;

determining the particular relative displacement of the first and second images associated with the peak value; and

calculating the average dimension between the first and second edges of the elements using the particular relative displacement of the first and second images.

4,965,843

METHOD AND APPARATUS FOR CODING DIGITAL IMAGE INFORMATION OBTAINED FROM DITHERING

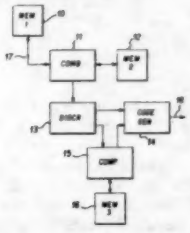
Etienne L. M. E. van Dorsselaer, Sintjansteen, Netherlands, assignor to OCE Nederland B.V., Venlo, Netherlands

Filed Jan. 26, 1988, Ser. No. 148,593

Claims priority, application Netherlands, Jan. 27, 1987, 8700182

Int. Cl.[5] G06K 9/00

U.S. Cl. 382—50 **8 Claims**



1. A method of coding digital image information obtained by dithering of an image consisting of pixels with a dither matrix, said method comprising (1) combining in a predetermined order binary dither values of said pixels compared during dithering with the same threshold value of the dither matrix to form strings each associated with one threshold value and (2) subjecting all of said strings to a compression operation wherein said compression comprises the steps of

(a) selecting a threshold value d_{max} and a threshold value d_{min} of said dither matrix, dividing the threshold values into at least two ranges;

(b) allocating an individual code to each string associated with a threshold value in the range bounded by d_{min} and d_{max}; and

(c) allocating at least one group code to the two groups of strings associated with threshold values above or below the range bounded by d_{min} and d_{max}.

4,965,844

METHOD AND SYSTEM FOR IMAGE TRANSFORMATION

Masaaki Oka, and Yoshitaka Kuruuchi, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 31, 1986, Ser. No. 845,955

Claims priority, application Japan, Apr. 3, 1985, 60-70330

Int. Cl.[5] G06K 9/00

U.S. Cl. 382—44 **18 Claims**

1. A method of transforming a two-dimensional input video image data onto a three-dimensional surface comprising the steps of:

(A) defining said three-dimensional surface;

(B) providing mapping data for transforming said two-dimensional input video image data onto said surface;

(C) storing said two-dimensional input video image data in a first memory means;

(D) transforming said two-dimensional input video image data stored in said first memory means according to said mapping data so as to provide a two-dimensional output video image data;

(E) calculating first vectors respectively representing normal vectors of minute areas provided on said surface;

(F) calculating second vectors respectively representing directions from said minute areas toward an imaginary light source disposed at an arbitrary position;

(G) calculating values of an inner product of said first and said second vectors;

(H) calculating weighting factors according to said values of said inner products of said first and said second vectors calculated in step (G), said weighting factors respectively respresenting shading on said minute areas caused by said imaginary light source; and

(I) weighting a signal representative of said two-dimensional input video image data according to said weighting factors, whereby both luminescence and hue components of said signal are changed according to said weighting factors.

4,965,845

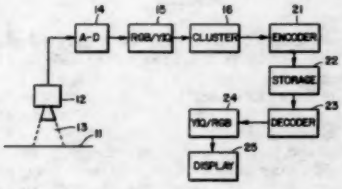
COMPRESSION AND RECONSTRUCTION OF COLOR AERONAUTICAL CHART IMAGES

Luen C. Chan, Indian Harbour Beach, and Kenrick W. Kautz, Palm Bay, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 773,228, Sep. 5, 1985, abandoned. This application Jan. 20, 1988, Ser. No. 145,980

Int. Cl.[5] G06K 9/00

U.S. Cl. 382—56 **16 Claims**



1. A method of compressing the effective bandwidth of digitally encoded signals representative of the color composition of picture elements that make up a multiple color image pattern comprising steps of:

(a) transforming the color composition of each picture element into its luminance and in-phase and quadrature chrominance components;

(b) generating a histogram of the luminance and chrominance components obtained in step (a) for the picture elements of said image pattern, said histogram being formed of a plurality of clusters of said luminance and chrominance components;

(c) for each cluster of which said histogram generated in step (b) is formed, generating a respective first digital code representative thereof;

(d) for each picture element, generating a second digital code, corresponding to that first digital code which is representative of the cluster to which the luminance and chrominance components of said each picture element is closest; and

(e) for each of respective pluralities of said second digital codes associated with prescribed pluralities of neighboring picture elements of said multiple color image pattern,

generating a third digital code representative of a prescribed combination of colors of which a respective one of said prescribed pluralities of neighboring picture elements within said multiple color image pattern may be formed.

4,965,846

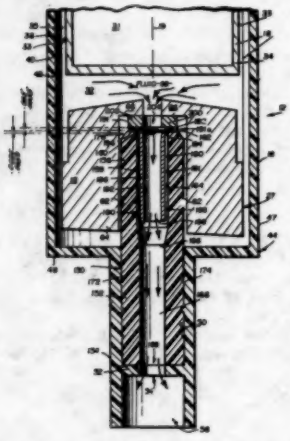
PIVOT PIN BEARING/SEAL WITH LOOSE EYELET ESPECIALLY SUITED FOR DISPOSABLE CONTINUOUS FLOW BLOOD FILTRATION SYSTEM CARTRIDGES

Warren P. Williamson, IV, Huntington Beach, Calif., assignor to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 129,879, Dec. 4, 1987, abandoned, which is a continuation of Ser. No. 895,381, Aug. 11, 1986, abandoned. This application Oct. 20, 1988, Ser. No. 262,259

Int. Cl.[5] F16C *33/74*

U.S. Cl. 384—138 **36 Claims**



1. A pivot bearing for supporting a first body and permitting said first body to rotate relative to a second body, said bearing comprising:

structure fixed with respect to said second body and defining a recess having an inside edge surrounding said recess,

an eyelet having a shank with an outwardly-extending flange at one end, the junction of said flange and said shank including a contacting surface, said shank being rotatably disposed within said recess and said contacting surface rotatably contacting said edge; and

means disposed between said first body and said flange for coupling said flange to rotate with said first body relative to said structure.

4,965,847

METHOD AND APPARATUS FOR DETECTING DEVIATION OF MOTOR SPEED FROM FREQUENCY OF POWER SUPPLY

Keith O. Jurkowski, Waukesha, and David C. Wycoff, Elm Grove, both of Wis., assignors to Harnischfeger Corporation, Brookfield, Wis. and Yaskawa Electric Mfg. Co. Ltd., Tokyo, Japan

Filed Jan. 31, 1989, Ser. No. 304,527

Int. Cl.[5] G05B *5/00*

U.S. Cl. 388—814 **13 Claims**

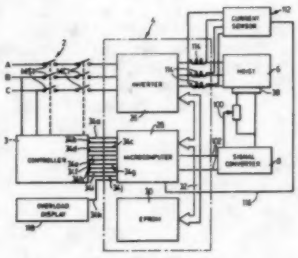
1. In a method for operating a hoist having an alternating current motor rotatably driving a drum, a brake coupled to the drum and motor for stopping and holding the drum and motor from rotation, and a selectively variable frequency alternating current power supply connected to the motor, the method including the detection of the deviation of the actual speed of the motor from a desired speed, the steps comprising:

sensing the frequency of the power supplied to the motor and producing a frequency supply signal representative of said frequency;

sensing the actual speed of the motor and producing a speed signal indicative of said actual speed;

determining the difference between the frequency supply signal and the speed signal, and producing a difference signal representative of such difference;

selecting a first frequency value representative of a motor



speed which is not to be exceeded as a result of variations in the power supply frequency and any other forces affecting the motor speed:

producing a first s[illegible] indicative of the first frequency value; and

comparing the difference signal with the first signal and producing an output signal if the former exceeds the latter to the brake to cause it to stop and hold the drum and motor.

4,965,848

CONTROL CIRCUIT FOR A PERMANENT MAGNET OR CONSTANT EXCITATION DIRECT CURRENT MOTOR, PARTICULARLY FOR WASHING MACHINES

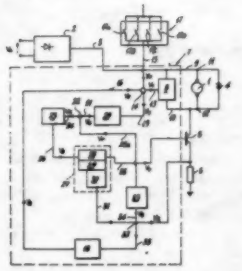
Enrico Vasconi, Varano Borghi; Carlo Mazzucchelli, Fagnano Olona; Diego Torriani, Cernobbio, and Mario Giganti, Milan, all of Italy, assignors to Whirlpool International B.V., Eindhoven, Netherlands

Filed Mar. 3, 1989, Ser. No. 319,006

Claims priority, application Italy, Mar. 4, 1988, 19661 A/88

Int. Cl.[5] H02P *5/00*

U.S. Cl. 388—815 **11 Claims**



1. A motor control circuit comprising: reference means for providing a reference signal (V_R) indicative of a desired motor speed, means for measuring motor voltage to determine actual motor speed, said measuring means deriving an actual speed voltage (V_1) which includes motor counter emf and motor armature losses, modulator means for receiving a control signal in order to control in turn at least one static switch connected in series with the motor, and control signal generating

means for generating the control signal as a function of a difference between the actual motor speed and the desired motor speed, wherein the control circuit comprises means for providing a signal (V_P) representative of power absorbed by the motor, compensator means for proividing a compensation signal (V_2) representative of motor armature losses, wherein the control signal generating means comprises means responsive to the speed voltage signal (V_1), the compensation signal (V_2) and the reference signal (V_R) for generating a further signal (V_4) representative of the difference between the reference signal and the motor counter emf, and means for generating a control signal (V_6) for the modulator means indicative of the difference between said further signal (V_4) and the motor power signal (V_P).

4,965,849

CORDLESS TELEPHONE

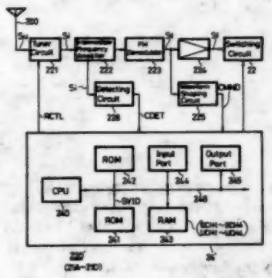
Takushi Kunihiro, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 6, 1989, Ser. No. 403,477

Claims priority, application Japan, Sep. 29, 1988, 63-245501; Dec. 23, 1988, 63-324882

Int. Cl.[5] H04Q *7/00, 9/00*; H04B *15/00*

U.S. Cl. 455—34 **9 Claims**



1. In a cordless telephone of multi-channel access (MCA) type comprising a master station and a plurality of remote stations, and in which said master station includes a plurality of sets of transmitting and receiving circuits, and communication and control channels are simultaneously opened between said master station and said remote stations:

said master station further including memory means, means for causing one of said receiving circuits to sequentially scan said communication channels and to provide data indicating each vacant communication channel, means for storing said data as vacant channel information in said memory means, means for inhibiting storage of said vacant channel information in said memory means in the event that opening of a channel by the respective vacant communication channel between said master and remote stations would subject another of said communication and control channels to cross modulation disturbance, and means for selecting a vacant communication channel for opening between said master and remote stations only from among the communication channels indicated to be vacant by said vacant channel information actually stored in said memory means.

4,965,850

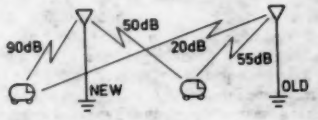
SYSTEM FOR AND METHOD OF ASSIGNING FREQUENCIES IN A COMMUNICATIONS SYSTEM WITH NO CENTRAL CONTROL OF FREQUENCY ALLOCATION

Jerry R. Schloemer, Edwards Subdivision, P.O. Box 337, Round Lake, Ill. 60073

Filed Jan. 23, 1989, Ser. No. 299,625

Int. Cl.[5] H04Q *7/00*

U.S. Cl. 455—33 **7 Claims**



1. In a communication system comprising a plurality of base sites comprising transmitter and receiver means and a plurality of mobiles comprising transmitter and receiver units which can be selectively operated on a plurality of frequency channels, a method of making frequency channel assignment of said mobiles to said base sites by real time signal comparisons without reference to a geographical pattern and without use of a central frequency assignment control said method consisting of conducting the following tests before making a frequency channel assignment to a new, that is to be assigned, mobile:

a. determining whether signal transmissions from a new base site, that is the base site to which said new mobile is to be assigned will cause interference at a previously assigned mobile,

b. determining whether said new mobile will be interfered with by signal transmissions from a previously assigned base site,

c. determining whether said new base site will be interfered with by signal transmissions from a previously assigned mobile, and

d. determining whether signal transmissions from said new mobile causes interference at a previously assigned base site; and, making said channel assignment.

4,965,851

RECEIVING ARRANGEMENT WITH A RECEPTION CARRIER FREQUENCY ALTERNATELY CHANGED FROM ONE TO ANOTHER

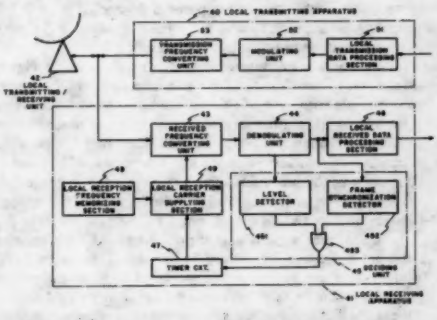
Shunichiro Tejima, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed May 26, 1989, Ser. No. 357,362

Claims priority, application Japan, May 28, 1988, 63-131232

Int. Cl.[5] H04B *15/00*

U.S. Cl. 455—52 **2 Claims**



1. A receiving arrangement which includes receiving means for receiving a transmission radio signal through a transmission radio path to produce a received radio signal of a received

carrier frequency, converting means for converting said received radio signal into a converted signal of an intermediate frequency by using a reception carrier signal of a reception carrier frequency, and demodulating means for demodulating said converted signal into a demodulated signal, wherein the improvement comprises:

deciding means connected to said demodulating means for deciding whether said demodulated signal is normal or abnormal, said deciding means producing an abnormal signal when said demodulated signal is abnormal;

measuring means connected to said deciding means and given a predetermined time interval for measuring a lapsed time after reception of said abnormal signal, said measuring means producing a time up signal when said lapsed time is equal to an integral multiple of said predetermined time interval;

memorizing means for preliminarily memorizing, as first and second memorized frequency signals, first and second frequency signals representative of first and second carrier frequencies, respectively, which are determined by said received carrier frequency and are different from each other; and

supplying means connected to said memorizing means, said measuring means, and said converting means for alternately supplying first and second carrier signals indicative of said first and said second memorized frequency signals, respectively, one at a time as said reception carrier signal to said converting means in response to said time up signal.

4,965,852

RADIO TRANSMITTER-RECEIVER SYSTEM FOR INCREASING OR DECREASING COMMUNICATION CHANNELS

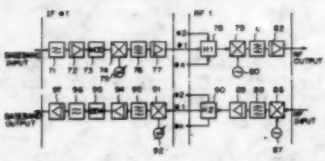
Susumu Sasaki, Fujisawa, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 25, 1987, Ser. No. 125,233

Claims priority, application Japan, Dec. 3, 1986, 61-288532

Int. Cl.[5] H04B *1/40, 1/74*

U.S. Cl. 455—82 **10 Claims**



1. A radio transmitter-receiver apparatus for increasing or decreasing communication channels between node stations of a communication network, said apparatus comprising:

a plurality of antenna means for receiving input RF signals and for transmitting output RF signals;

a plurality of transmitter-receiver means including RF portions and IF portions, said RF portions receiving the input RF signals from one of said antenna means and supplying the output RF signals to one of said antenna means, intermediate frequency output signals from said IF portions supplied to said RF portions and converted to the output RF signals, the input RF signals converted to intermediate frequency input signals and supplied to said IF portions, baseband input signals converted to the intermediate frequency output signals and supplied to said RF portions, the intermediate frequency input signal from said RF portions converted at said IF portions to baseband output signals, each of said IF portions being provided with a local oscillator generating a variable frequency;

IF multiplexer means, provided between said RF portions and said IF portions of said plurality of transmitter-receiver means, for receiving the intermediate frequency output signals from a plurality of said IF portions and supply multiplexed signals to said RF portions;

IF divider means for receiving the intermediate frequency input signals from said RF portions and supplying division signals to the plurality of said IF portions; and

a plurality of communication lines, each having a different frequency, provided between said plurality of antenna means forming the communication network.

4,965,853

RADIO RECEIVER CIRCUIT WITH TUNING FEEDBACK CONTROL FOR A TUNABLE BANDPASS FILTER

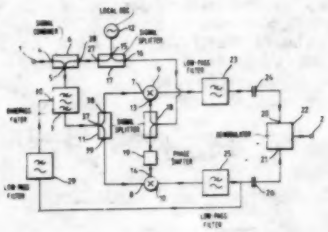
Michael E. Barnard, Reigate, United Kingdom, assignor to U.S. Philips Corp., New York, N.Y.

Filed Sep. 29, 1989, Ser. No. 414,805

Claims priority, application United Kingdom, Oct. 12, 1988, 8823879

Int. Cl.[5] H04B *1/30*

U.S. Cl. 455—209 **10 Claims**



6. A radio receiver circuit, comprising:

a tunable bandpass filter responsive to a tuning control signal for passing signals within a pass band having a center frequency to which the receiver circuit is tuned determined by the tuning control signal;

a local oscillator for generating a local oscillator signal having a frequency equal to the frequency to which the radio receiver is tuned;

means for applying a receiver input signal and the local oscillator signal to said tunable bandpass filter;

first and second mixer circuits;

means for applying the output signal of said tunable band pass filter to said first and said second mixer circuits;

a phase shifter;

means for applying the local oscillator signal to a first of said mixer circuits and to said phase shifter;

said phase shifter applying the phase-shifted local oscillator signal to the second of said mixer circuits whereby said second mixer circuit develops an output signal representative of the relationship of the local oscillator signal frequency and the bandpass filter center frequency;

tuning control signal generating means responsive to the output signal of said second mixer circuit for generating and for applying the tuning control signal to said band pass filter effective to tune said bandpass filter to the frequency of the local oscillator signal; and

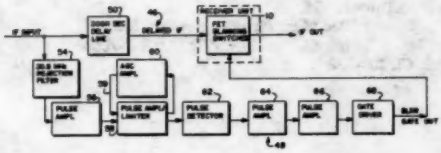
a demodulator receptive of the output signals from said first and said second mixers for demodulating the mixer output signals.

4,965,854

NOISE BLANKER WITH CONTINUOUS WAVE INTERFERENCE COMPENSATION

Ellis Glazebrook, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Nov. 30, 1988, Ser. No. 277,813
Int. Cl.[5] H04B *1/10*
U.S. Cl. 455—224 16 Claims



1. In a communications device, noise blanker apparatus for reducing interference due to noise present in information signals having frequencies within a predetermined frequency range comprising:

first means for delaying an information signal for a predetermined period of time;

second means coupled to receive said information signal for detecting the presence of noise pulses in said information signal, said second means including means for compensating for interference due to continuous wave signals outside said predetermined frequency range; and

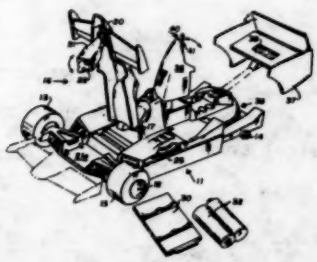
noise blanking means responsive to said first means and said second means for eliminating noise from said information signal.

4,965,855

AUTOMOBILE SHAPED MINIATURE RADIO SET

Shintaro Tsuji, Tokyo, Japan, assignor to Sanrio Company, Ltd., Tokyo, Japan

Filed Oct. 27, 1988, Ser. No. 265,214
Claims priority, application Japan, Oct. 27, 1987, 62-163942[U]
Int. Cl.[5] H04B *1/06, 1/08*
U.S. Cl. 455—344 7 Claims



1. A model device that looks like a racing car, said device comprising:

front and rear axles and wheels thereon,

a central portion, between said front and rear axles,

a hinged nose-like front portion extending forward of said front axle that can be swung open to disclose a cavity, and

a rear portion forward of said rear wheels,

a radio set in said central portion having an on-off and volume control dial on one side and a tuning dial on the other side, said central portion having said dials on an upper portion thereof, said central portion also having a bottom cover with a detachable portion leading into a bottom cavity,

a reading light inside the cavity of said nose-like portion and pivotally attached to said nose-like portion, and

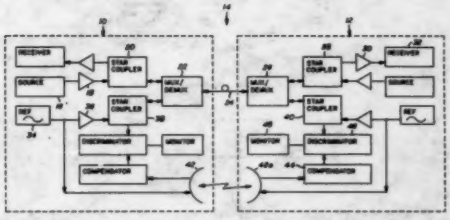
a rearmost portion detachably secured to said rear portion.

4,965,856

SECURE OPTICAL-FIBER COMMUNICATION SYSTEM

Anthony Swanic, Las Vegas, Nev., assignor to Arbus Inc., Las Vegas, Nev.

Filed May 23, 1989, Ser. No. 355,460
Int. Cl.[5] H04B *10/00*
U.S. Cl. 455—617 17 Claims



1. A system for alerting a user to the fact of an unauthorized tapping of an optical fiber communication system, comprising:

a means for generating data signals;

means for modulating a first optical carrier signal with said data signals;

means for providing a reference signal;

means for modulating a second optical carrier signal by said reference signal;

means for multiplexing the first and second modulated optical carrier signals into a fiber optic communication link;

means, coupled to said fiber optic communications link, for receiving, demultiplexing and demodulating the first and second modulated optical carrier signals to recover the data and reference signals;

means for providing a replica of said reference signal;

means for measuring the phase difference between the recovered reference signal and the replica of said reference signal as received over a communications link that is physically separate from said fiber optic communication link, there being an effective path-length difference therebetween; and

means for creating an alert signal when the measured phase difference between the recovered reference signal and the received replica of the reference signal becomes non-zero.

4,965,857

METHOD FOR SYNCHRONIZED POLARIZATION SWITCHING OF AN OPTICAL TRANSMISSION SIGNAL OF AN OPTICAL TRANSMISSION SYSTEM HAVING SUPERHETERODYNE RECEPTION AND AN APPARATUS FOR THE IMPLEMENTATION OF SAID METHOD

Franz Auracher, Baierbrunn; Alfred Ebberg, Munich; Bernd Noll, Munich; Eckhard Meissner, Munich, and Hermann-Johann Rodler, Bergen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 26, 1989, Ser. No. 412,406
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1988, 3833274
Int. Cl.[5] G02F *1/00*; H04B *10/00*; H01S *3/00*
U.S. Cl. 455—618 4 Claims

2. A transmitter for transmitting an optical transmission signal, said transmitter comprising:

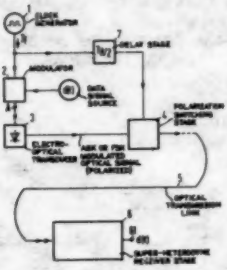
modulator means connected to a clock generator having a clock period and connected to a data input signal having first and second states or bits;

delay means connected to said clock generator for generat-

ing a delayed electronic signal by one-half of said clock period;

electro-optical transducer means for converting said data input signal into a polarized FSK- or ASK-modulated optical signal; and

a polarization condition switching means to which said



polarized FSK-modulated or ASK-modulated optical signal and said delayed electronic signal are supplied for generating an optical transmission signal whose polarization condition is switched between orthogonal said polarization condition states, said polarization switching occurring in a middle of each clock period and synchronized with a center of each bit of said data input.

4,965,858

POLARIZATION DIVERSITY OPTICAL RECEIVER FOR COHERENT OPTICAL COMMUNICATION

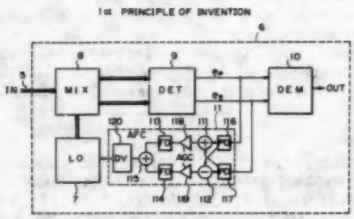
Takao Naito; Terumi Chikama; Shigeki Watanabe; Tetsuya Kiyonaga; Yoshihito Onoda; Hideo Kuwahara; Hiroshi Onaka, and Hideyuki Miyata, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 14, 1989, Ser. No. 310,628

Claims priority, application Japan, Feb. 19, 1988, 63-038021

Int. Cl.[5] H04B *10/06*

U.S. Cl. 455—619 **39 Claims**



1. A polarized wave diversity optical receiver for coherent optical communication, comprising:

optical local oscillating means for oscillating local oscillating light;

mixing means for mixing signal light transmitted through an optical fiber and the local oscillating light from said optical local oscillating means, to obtain first and second polarized component signals;

detecting means for detecting the first and second polarized component signals from said mixing means to output first and second intermediate frequency signals; and

frequency control means for controlling, in accordance with the first and second intermediate frequency signals from said detecting means, the oscillating frequency of said optical local oscillating means, said frequency control means comprising signal conversion means for obtaining an output control signal by combining a sum and a difference of the first and second intermediate frequency signals.

4,965,859

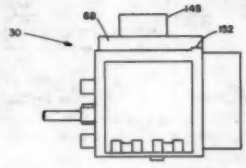
ELECTROMECHANICAL TIMER WITH IMPROVED BUSSING RETENTION

Ronald E. Cole, Greenwood, Ind., assignor to Emhart Industries, Inc., Towson, Md.

Filed Mar. 29, 1989, Ser. No. 330,147

Int. Cl.[5] H01H *43/10*; **H01R** *29/00*

U.S. Cl. 200—38 R **10 Claims**



1. In a timer comprising a motor-driven cam, electrical switches responsive to said cam, and electrical terminals connected to said switches and aligned in a row, all of which are supported by a housing, the improvement comprising:

insulating means located on said housing for providing insulation between said terminals;

a first channel formed in said insulating means and spaced from said row of terminals;

first electrical bus means in said first channel;

a plurality of second channels formed in said insulating means, each second channel connecting said first channel and one of said terminals; and

second electrical bus and bias means in at least two of said second channels for electrically connecting said first bus means and selected ones of said terminals and for providing a first bias force for holding said first electrical bus means in said first channel and said second electrical bus and bias means in said second channels.

4,965,860

CAPACITOR TYPE WELDING POWER UNIT

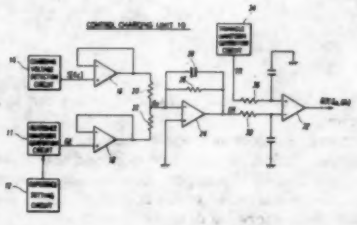
Takashi Jochi, Abiko, Japan, assignor to Miyachi Electronic Company, Chiba, Japan

Filed Feb. 15, 1989, Ser. No. 310,680

Claims priority, application Japan, Mar. 15, 1988, 63-61106; Jun. 21, 1988, 63-153149

Int. Cl.[5] B23K *11/26*

U.S. Cl. 219—113 **6 Claims**



1. A capacitor type welding power unit in which one or more thyristors are controlled to charge a capacitor that is made to instantaneously discharge an electrical charge stored therein to produce a welding current after the charging volt-

age of said capacitor has reached a predetermined target value, comprising:

a means for generating a reference signal which changes linearly with time during the charging;

a means for detecting the charging voltage of said capacitor;

a means for comparing the detected charging voltage and said reference signal and for generating an error signal representative of the difference therebetween; and

a means for controlling the control angle of said one or more thyristors in accordance with said error signal so that the charging voltage of said capacitor changes linearly with time during the charging.

4,965,861

TWO-DIMENSIONAL PROPORTIONAL COUNTER FOR POSITION SENSITIVE MEASUREMENT OF IONIZING RADIATION

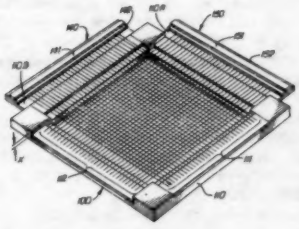
Heinz A. A. W. Filthuth, Bahnhofstrasse 29, D-7540 Neuenburg, Fed. Rep. of Germany

Filed Oct. 17, 1988, Ser. No. 258,725

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1987, 3735296

Int. Cl.[5] G01T *1/185*

U.S. Cl. 250—385.1 30 Claims



1. In a two-dimensional proportional counter for position sensitive measurement of ionizing radiation in one plane, the counter having a counting chamber with a wire anode grid and at least one wire cathode grid spaced from, and located above or below the anode grid, each grid being composed of a plurality of parallel wires, two of the grids of the chamber being used for readout and the wires of one of the two grids extending transversely to the wires of the other one of the two grids, the counter further having two delay lines each associated with a respective one of the two readout grids and the wires of each readout grid being connected to its associated delay line so that the pulses generated in each wire are coupled into a defined point of the associated delay line, and the counter further including an evaluation unit connected to the delay lines to receive pulses therefrom to effect position determination, the improvement wherein: each said delay line is a continuous delay line composed of a coil constituted by a plurality of windings and a continuous capacitor strip parallel to and at a defined spacing from said coil; the wires of each of said two readout grids are connected directly to the windings of the associated coil; and each said delay line is constructed to have a capacitance which is substantially greater than the capacitances between the wires of the associated readout grid.

4,965,862

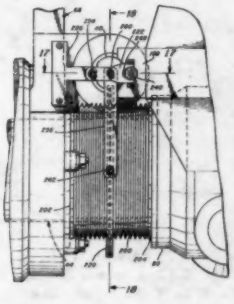
DISK SCANNING APPARATUS FOR BATCH ION IMPLANTERS

Avrum Freytsis, Swampscott, and Judy E. Sedgewick, Georgetown, both of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 366,202, Jun. 9, 1989, Pat. No. 4,899,059, which is a continuation of Ser. No. 195,729, May 18, 1988, abandoned. This application Sep. 15, 1989, Ser. No. 407,855

Int. Cl.[5] H01J *37/20*

U.S. Cl. 250—453.1 20 Claims



1. Apparatus for workpiece translation in vacuum, comprising:

a stationary assembly including a vacuum envelope defining a vacuum chamber;

a movable assembly including workpiece mounting means and scan arm means for supporting said workpiece mounting means within said vacuum chamber, said scan arm means extending through said vacuum envelope and being mounted for movement around a scan axis;

scan drive means for providing reciprocating movement of said scan arm means and said workpiece mounting means around said scan axis along an arc-shaped path;

bellows means for sealing said scan arm means to said vacuum envelope while enabling movement of said scan arm means around said scan axis, said bellows means being subjected to asymmetrical deflection and to a pressure difference between interior and exterior surfaces thereof during movement of said scan arm means around said scan axis; and

means for guiding an intermediate portion of said bellows means as said scan arm means moves around said scan axis.

4,965,863

GALLIUM ARSENIDE DEPLETION MADE MESFIT LOGIC CELL

Seymour R. Cray, Chippewa Falls, Wis., assignor to Cray Computer Corporation, Colorado Springs, Colo.

Filed Oct. 2, 1987, Ser. No. 104,758

Int. Cl.[5] H03K *19/017*

U.S. Cl. 307—450 20 Claims

1. A gallium arsenide depletion mode MESFET logic cell, comprising:

a diode logic section operable for performing a voltage-switch logical decision and operable for producing a translated logical result;

a voltage level shift section connected to said diode logic section operable for level shifting said logical result;

at least one amplifier section connected to said level shift section operable for producing a voltage-switch output signal;

said amplifier section further includes:

an inverter section connected to said level shift section operable for inverting the level-shifted logical result;

a second level shifting section connected to said inverter section and operable for capacitively coupling said logical result to an output section; and

said output section connected to said second level shifting section and having load driving transistors for amplifying the logical result to produce said voltage-switch output signal.

4,965,864

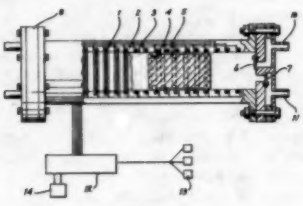
LINEAR MOTOR

Paul E. Roth, 2932 N. Casa Tomas, Phoenix, Ariz. 85016, and Bruce A. Roth, 4756 W. Michigan, Glendale, Ariz. 85308

Filed Dec. 7, 1987, Ser. No. 129,541

Int. Cl.[5] H02K *41/00*

U.S. Cl. 318—135 **4 Claims**



1. A linear motor pump comprising:

(a) a hollow closed cylinder formed by a plurality of axially spaced electrically energizable drive coils, said coils producing magnetic flux when energized;

(b) ferromagnetic material positioned between and about said coils and extending from an inner surface of said cylinder radially outwardly beyond said coils;

(c) at least one piston positioned within said cylinder for movement along an axis of said cylinder and forming an annular gap between said cylinder and piston, said piston including means for producing magnetic flux;

(d) power supply means for energizing said drive coils;

(e) logic control circuitry connected to said power supply and to said drive coils for controlling the energization of said drive coils;

(f) piston position sensing means connected to said control circuitry for detecting the position of said piston within said cylinder;

(g) said control circuitry responsive to said sensing means for selectively energizing said coils to produce a desired piston motion;

(h) said hollow closed cylinder having an inlet and an outlet for admitting fluid to the cylinder and for discharging fluid from the cylinder; and

(i) means for sensing temperature and pressure within said cylinder connected to said logic control circuitry for determining optimum piston speed and stroke.

4,965,865

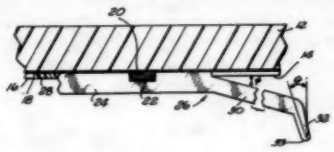
PROBE CARD FOR INTEGRATED CIRCUIT CHIP

Dale T. Trenary, San Jose, Calif., assignor to General Signal Corporation, Stamford, Conn.

Filed Oct. 11, 1989, Ser. No. 255,779

Int. Cl.[5] G01R *31/02, 1/06*

U.S. Cl. 324—158 P **17 Claims**



13. A probe card for interconnection between pads on an integrated circuit chip and leads on a printed circuit board to determine the operability of the integrated circuit chip, including,

a dielectric substrate having a planar surface, there being a plurality of channels in the planar surface, each of the channels being defined by at least one wall extending linearly on the dielectric substrate in spaced relationship to one another and terminating at its inner end at a position displaced from the center of the planar surface to contact an individual one of the pads on the integrated circuit chip,

there being electrically conductive material on at least one of the walls defining each of the channels,

a plurality of detents each disposed in an individual one of the channels at a particular position along the length of such channel,

a plurality of probes each disposed in an individual one of the channels and each having a first portion with a detent for mating with the detent in such individual channel, the first portion of each of the probes having a particular length and being disposed in abutting relationship with the wall of the associated channel along such particular length,

each of the probes having a second portion extending away from the planar surface of the dielectric substrate at a first particular angle relative to the planar surface of the dielectric substrate, and

each of the probes having a probe tip portion extending from the second portion of such probe at a second particular angle relative to the planar surface of the dielectric substrate.

4,965,866

VERY LOW LOSS MICROWAVE MODULATOR HAVING TWO PHASE STATES O, π

Didier Martineau, Honorine, France, assignor to Alcatel N.V., Stuttgart, Fed. Rep. of Germany

Filed Sep. 18, 1989, Ser. No. 409,533

Claims priority, application France, Sep. 19, 1988, 88 12192

Int. Cl.[5] H01P *3/08, 1/18*

U.S. Cl. 333—164 **2 Claims**

1. A very low loss microwave modulator having two phase states: 0, π; the modulator comprising:

an input which receives a pure carrier at a frequency f_0;

an output which delivers a carrier modulated with two phase states;

a first switching element;

in parallel with said first switching element, a second switching element connected in series with a main transmission line; and

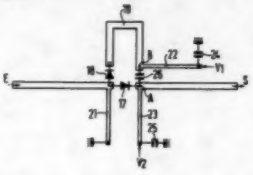
a control system for causing a selected one of the first and second switching elements to be conductive and for causing the other one to be non-conductive;

wherein said main transmission line is of length $L=\lambda_0/2$

where λ_0 is the wavelength corresponding to the frequency f_0, and wherein said control circuit comprises three transmission lines of length $\lambda_0/4$ having their first ends respectively connected as follows:

the first line to the point common to the two switching elements;

the second line to the second terminal of the first switching element; and



the third line to that end of the main line which is not connected to the second switching element;

the first line having its second end connected to ground, and the other two lines having their second ends connected to receive respective control signals and connected to ground via respective capacitors; and

a capacitor being inserted between the main line and the second terminal of the first switching element.

4,965,867

OFFSET COMPENSATION CIRCUIT

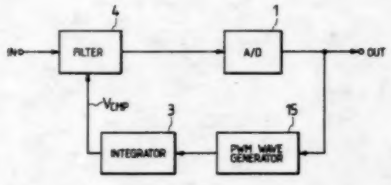
Masami Tsuchida; Ichiro Miyake; Tokihiro Takahashi; Shinichi Wakamura, all of Saitama; Yoshimi Iso, Kanagawa; Takao Arai, Kanagawa, and Hiroo Okamoto, Kanagawa, all of Japan, assignors to Pioneer Electronic Corporation and Hitachi, Ltd., both of Tokyo, Japan

Filed Aug. 22, 1988, Ser. No. 234,874

Claims priority, application Japan, Aug. 20, 1987, 62-205031; Aug. 20, 1987, 62-205032; Aug. 20, 1987, 62-205033; Aug. 26, 1987, 62-210144

Int. Cl.[5] H03M *1/06*

U.S. Cl. 341—118 **23 Claims**



1. An offset compensation circuit for compensating a DC offset which occurs in a circuit line including an A/D converter for sampling an analog input signal and converting each sampled value into a digital signal of n bits, comprising:

a pulse width modulatic wave generator for producing a pulse width modulation wave as an offset-eliminating control signal which is calculated based on the values of the m ($1 < m \leqq n$) most significant bits of said digital signal sent out from said converter;

an integrator for integrating said wave and outputting an offset compensation voltage; and

means for performing negative feedback of said offset compensation voltage to an analog section of said A/D converter to compensate for said DC offset.

4,965,868

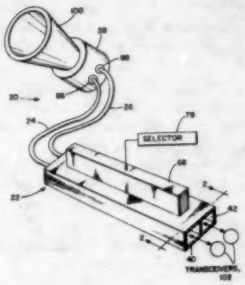
ELECTROMAGNETIC POLARIZATION SELECTOR

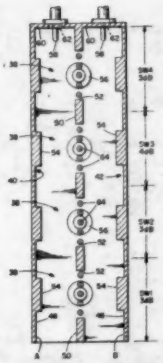
Mon N. Wong, Torrance, and Gregory D. Kroupa, Hawthorne, both, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 13, 1989, Ser. No. 365,391

Int. Cl.[5] H01Q *13/00*; H01P *1/17*

U.S. Cl. 343—756 **5 Claims**





4. An antenna system providing for selectable polarization comprising:

a horn radiator;

a switchable hybrid coupler assembly having two output ports and at least one input port; and

a plural mode launcher of electromagnetic waves having two input ports connected to respective ones of the two output ports of said coupler assembly, said mode launcher comprising a first mode launching means and a second mode launching means coupled to respective ones of the input ports of said mode launcher, said first launching means producing a first polarization and said second launching means producing a second polarization different from said first polarization, said mode launcher combining radiations of both of said launching means to produce a resultant polarization; and wherein

said coupler assembly comprises a first waveguide and a second waveguide, said first and said second waveguides terminating respectively in a first and a second of the output ports of said coupler assembly; a plurality of hybrid coupling means arranged serially along said first waveguide and said second waveguide for coupling microwave energy between said first waveguide and said second waveguide; and selection means for selectively activating individual ones of said coupling means to couple micro-

wave energy between said first and said second waveguide, and for selectively deactivating individual ones of said coupling means to inhibit a coupling of microwave energy between said first and said second waveguides; and

said mode launcher further comprises a cylindrical housing with an electrically conductive end wall, the housing enclosing said first and second launching means, said horn radiator connecting to an open portion of said housing opposite said end wall for coupling radiation with said resultant polarization from said mode launcher to radiate an electromagnetic wave with said resultant polarization; and,

wherein said plurality of coupling means includes three coupling means each of which provides for an even division of electromagnetic power between said first waveguide and said second waveguide, and a fourth coupling means providing for an uneven division of electromagnetic power between said first waveguide and said second waveguide to provide selectively for radiations of both circular and elliptical polarizations of either hand and linear polarizations at plural orientations.

4,965,869

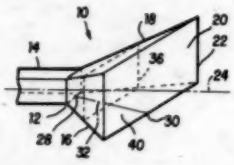
APERTURE ANTENNA HAVING NONUNIFORM RESISTIVITY

John D. Fortney, San Diego, Calif., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jun. 23, 1987, Ser. No. 65,389

Int. Cl.[5] H01Q *19/14*

U.S. Cl. 343—781 R **13 Claims**



1. An aperture antenna having a substantially smooth and continuous reflective surface disposed about a longitudinal axis, said reflective surface having a peripheral edge lying in a first plane substantially perpendicular to said longitudinal axis, a transition boundary lying in a second plane substantially parallel to and spaced from said first plane, and a transition zone located between said transition boundary and said peripheral edge, a selected portion of said transition zone having nonuniform resistivity along said reflective surface axially.

4,965,870

IMAGE FORMING APPARATUS WITH USE OF A LASER BEAM

Hirofumi Hasegawa; Naoto Ohmori; Yukio Yamada, and Narutaka Yoshida, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 29, 1989, Ser. No. 374,002

Claims priority, application Japan, Jun. 29, 1988, 63-162212

Int. Cl.[5] G03B *27/54*

U.S. Cl. 355—68 **7 Claims**

1. An image forming apparatus, comprising:

an original glass for supporting an original;

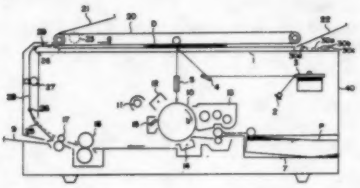
a rotatable photosensitive member;

laser beam radiating means;

optical means for guiding the laser beam radiated from said laser beam radiating means to said original glass and for projecting an image reflected from an original onto said photosensitive member;

scanning means for scanning the reflected image from the surface of an original relatively to said optical means;

control means for turning on and off said laser radiating means to radiate a laser beam in accordance with image data;



means for making a latent image formed on said photosensitive member visible on a paper sheet; and

means for transporting said paper sheet with a visible image onto said original glass.

4,965,871

CONTINUOUS PLURAL PAGE COPYING METHOD FOR A COPIER

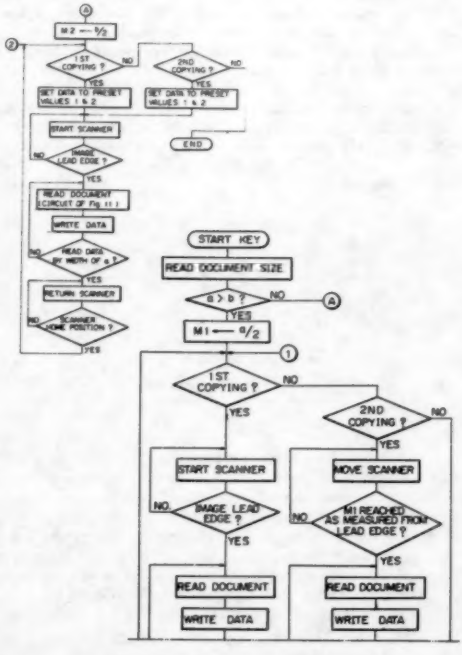
Masaaki Ogura, Kawasaki; Kiyotaka Ohta, Soka; Junji Kurokawa, Yokohama; Masaji Ito, Ageo, and Toshiaki Hayasaka, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 29, 1988, Ser. No. 213,252

Claims priority, application Japan, Jun. 30, 1987, 62-163588

Int. Cl.[5] G03B *27/52*

U.S. Cl. 355—55 **4 Claims**



1. A method of continuously printing a plurality of pages of a document for a copier, comprising the steps of:

(a) laying a document on a glass platen of the copier;

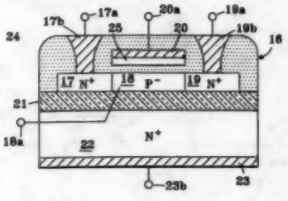
(b) reading a size of the document on the glass platen;
(c) determining a lengthwise direction of the document;
(d) calculating one half of the size of the document in the lengthwise direction determined to produce half size data;
(e) storing the half size data of the document in a memory;
(f) executing a reading operation for first copying;
(g) determining the end of the reading operation to a point which is associated with the half size data stored in the memory; and
(h) executing a reading operation for second copying,
whereby said documents can be laid in both a horizontal and vertical direction.

4,965,872

MOS-ENHANCED, SELF-ALIGNED LATERAL BIPOLAR TRANSISTOR MADE OF A SEMICONDUCTOR ON AN INSULATOR

Prahalad K. Vasudev, 290 Autumnwood St., Thousand Oaks, Calif. 91360

Filed Sep. 26, 1988, Ser. No. 249,038
Int. Cl.[5] H01L *27/12, 29/73, 29/78*
U.S. Cl. 357—35 **12 Claims**



1. An improved, lateral bipolar transistor, comprising:
a first insulation layer;
a first semiconductor layer adjacent to said first insulation layer, said first semiconductor layer having emitter, base, and collector regions formed therein in a lateral bipolar transistor configuration;
a first gate on said first insulation layer aligned with said base region and separated from said base region by said first insulation layer, said first gate controlling the base resistance in response to voltage signals applied to said first gate;
means for establishing electrical conditions to said emitter, base, and collector regions and an active electrical connection to said first gate;
a second insulation layer on the opposite side of said first semiconductor layer from said first insulation layer;
a second gate on said second insulation layer separated from the base region by said second insulation layer, said second gate controlling the base resistance independent of said first gate in response to voltage signals applied to said second gate, the interface between said second insulation layer and aid second gate being substantially planar; and
means for establishing an active electrical connection to said second gate.

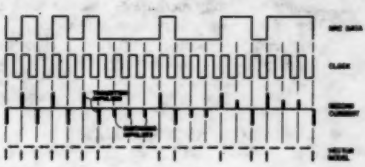
4,965,873

PILOT ENHANCED/AMPLITUDE EQUALIZED IMPULSE MAGNETIC

R. Kent White, 420 Kisconko Turn, Fort Washington, Md. 20744

Continuation of Ser. No. 220,890, Jun. 16, 1988, abandoned, which is a continuation of Ser. No. 66,565, Jun. 26, 1987, abandoned. This application Apr. 10, 1989, Ser. No. 334,766
Int. Cl.[5] G11B *5/09, 15/14*
U.S. Cl. 360—41 **32 Claims**

1. In a method of magnetic recording of data by means of a magnetic recording head having a recording gap and a magnetic recording medium having a recording surface, wherein a relative traverse is effected between said head and said medium across said gap, said head providing a determined length of effective recording field along the line of said traverse, comprising applying to said recording head a sequence of electrical data impulses of short time duration and at spaced time intervals in a predetermined phase relation to a clock signal for effecting magnetic recording thereof in said medium as recorded increments, the time duration of each of said data impulses being a small fraction of the time period for said traverse across gap, the improvement comprising: generating a pilot signal and applying said pilot signal to said recording head, said pilot signal comprising a sequence of regularly



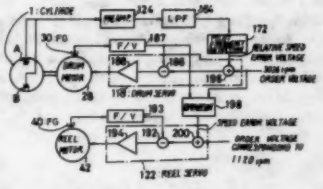
recurring pilot impulses having a time duration for each pilot impulse of a fraction of the time period for said traverse across said gap, and a time period between successive pilot impulses of approximately said time period of traverse over said length of effective recording field, said pilot impulses being made to be substantially phase coherent with said data impulses and being constructively additive thereto, and being of lesser amplitude than said data impulses, whereby said pilot signal enhances the recording of said data impulses and provides a substantially equalized recorded continuum between data impulses when the spaced time interval between successive data impulses is greater than the time period of traverse over said length of effective recording field.

4,965,874

MAGNETIC RECORDING AND REPRODUCTION DEVICE WITH FAST FEED/REWIND HEAD TO TAPE SPEED CONTROL

Shohei Yamazaki, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Mar. 9, 1988, Ser. No. 165,924
Claims priority, application Japan, Mar. 10, 1987, 62-54974
Int. Cl.[5] G11B *5/52, 15/18*
U.S. Cl. 360—70 **8 Claims**



1. A magnetic recording and reproducing device comprising:
a rotary head incorporating a plurality of heads for recording and reproducing an input signal by tracing a magnetic recording medium, said heads also reproducing signals recorded on left and right adjacent tracks simultaneously, and data recorded on said magnetic recording medium including the input signal, a synchronizing signal used for timing control of recording and reproducing of said input signal and a pilot signal of a predetermined frequency used for tracking control;
tracking control means comprising:

tracking error signal generation means for generating, based on the timing of said synchronizing signal, a tracking error signal by detecting crosstalk components of the pilot signals on left and right adjacent tracks and comparing these components with each other; and

first speed control means for controlling, responsive to the tracking error signal, a relative speed of said magnetic recording medium with respect to said heads of said rotary head;

pilot signal detection means for detecting a pilot signal during fast feeding or rewinding of said magnetic recording medium; and

second speed control means for controlling at least one of rotation speed of said rotary head and running speed of said magnetic recording medium during the fast feeding or rewinding of the magnetic recording medium so that said pilot signal can be detected substantially at its predetermined frequency.

4,965,875

FLOURESCENT LAMP

Heinrich Korte, Ihrhove, and Theo Spix, Oldenburg, both of Fed. Rep. of Germany, assignors to Korte-Licht, Ihrhove, Fed. Rep. of Germany

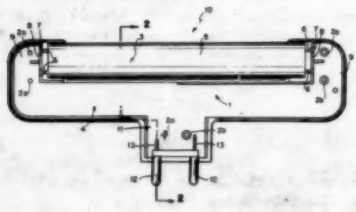
PCT No. PCT/DE87/00039, § 371 Date Feb. 22, 1988, § 102(e) Date Feb. 22, 1988, PCT Pub. No. WO87/04771, PCT Pub. Date Aug. 13, 1987

PCT Filed Jan. 31, 1987, Ser. No. 123,063

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1986, 3603264

Int. Cl.[5] F21S *3/00*

U.S. Cl. 362—217 **19 Claims**



1. A fluorescent lamp comprising:

a fluorescent tube, and

a connecting element for establishing connection with a source of current, said connecting element including a light socket plug having contact plugs electrically connected to the fluorescent tube and projecting on one side, said light socket plug being shaped like a flat plug and the area of the connecting element facing the contact plugs being shaped as a housing for said fluorescent tube, said housing including two separable, identical half shells.

4,965,876

LIGHTING APPARATUS

Tivadar Földi, Irinyi u. 36/b, 1117-Budapest; Gábor Biró, Gönezy u. 2, 1093-Budapest; Tamás Barna, Ady E. u. 9/d, 1024-Budapest; Imre Nagy, Béla u. 92, 1165, Budapest, and László Vincze, Uzsoki 12, 1145-Budapest, all of Hungary

Continuation-in-part of Ser. No. 107,952, Oct. 13, 1987, abandoned. This application May 26, 1989, Ser. No. 357,366

Claims priority, application Hungary, Oct. 13, 1986, 4254/86

Int. Cl.[5] F21V *7/00*

U.S. Cl. 362—247 **10 Claims**

1. A lamp structure which comprises:

(i) a concave reflector having an axis

(ii) a plurality of light sources, wherein the number of light sources is N, said light sources being spaced apart within said reflector and arranged about said axis on a notional annulus

(iii) a body disposed within the reflector substantially concentrically about said axis said body having a plurality of reflective segments on its surface outwardly from said axis, the number of reflective segments being N or a multiple of N, each segment viewed in cross-section having at least two curved surfaces that meet together in a peak, each light source being located opposite to the peak of a respective segment, and wherein intermediate between each pair of adjacent light sources, the body includes a further peak that extends into the notional annulus on which the light sources are arranged to shield the adjacent light sources from each other.

4,965,877

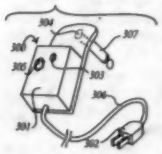
POWER SUPPLY SYSTEM

Dennis R. Gunn, Shiratori 2-5-13, Asou-Ku, Kawasaki-Shi, Kanagawa-ken, Japan (215)

Filed Apr. 7, 1989, Ser. No. 336,651

Int. Cl.[5] H02M *1/00*

U.S. Cl. 363—146 **13 Claims**



1. In a DC power supply system for supplying power from a DC power source to a unit having an audio output jack and a DC input jack discrete from said audio output jack, a cord comprising:

a first insulated conducting element;

a second conducting element for electromagnetically shielding said first conducting element;

a third insulated conducting element, said third conducting element being provided for conducing DC current;

a first pair of jacks, said first pair of jacks being of a first form and being connected to opposite ends of said first insulated conducting element for conducting an audio signal; and

a second pair of jacks, said second pair of jacks being dis-

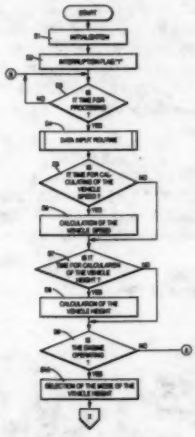
crete from, and of a different form than, said first pair of jacks for supplying DC power from said power source to said unit.

4,965,878

VEHICLE HEIGHT CONTROL SYSTEM

Masataka Yamagiwa, Aichi, and Naoki Yamada, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya City, Japan

Filed Nov. 30, 1988, Ser. No. 277,986
Int. Cl.[5] B60G *17/00*
U.S. Cl. 364—424.05 **14 Claims**



1. A height control device for a vehicle, the vehicle comprising a body, at least two axles with a first wheel and a second wheel rotatably disposed near to opposite ends of each of said axles, the device comprising:

suspension means operated by fluid pressure for generating vertical movement between said body and each of said wheels comprising a suspension device provided near each said wheel;

a fluid pressure source;

a suspension valve corresponding to each said suspension device and disposed between each said suspension device and said fluid pressure source;

an exhaust valve in pneumatic communication with each said suspension valve means and said fluid pressure source;

a height sensor for detecting a height between a rotating center of each said wheel and said body and outputting a signal representative thereof;

a speed sensor for detecting and generating an output signal representative of the speed of said vehicle; and

control means having at least a first and a second possible vehicle operating condition for controlling at least one of said suspension valve means to operate the corresponding suspension device and controlling said exhaust valve means to vary the fluid pressure presented to said suspension devices;

said first possible vehicle operating condition being whenever the difference between said output signals of any two height sensors is greater than a first predetermined amount and the output signal from said speed sensor indicates a vehicle speed greater than a second predetermined value;

said second possible vehicle operating condition being whenever the difference between said output signals of any two height sensors is greater than a first predetermined amount and the output signal from said speed sensor indicates a vehicle speed less than a second predetermined amount;

said control means, responsive to said height sensor output signals in said first possible vehicle operating condition, permitting control of said vertical movement between said body and said wheels to obtain a new vehicle height position; and

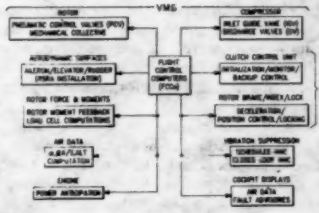
said control means, responsive to said height sensor output signals in said second possible vehicle operating condition, inhibiting control of said vertical movement between said body and said wheels to retain a current vehicle height position.

4,965,879

X-WING FLY-BY-WIRE VEHICLE MANAGEMENT SYSTEM

William C. Fischer, Jr., Monroe, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 13, 1988, Ser. No. 257,474
Int. Cl.[5] G06F *15/50*
U.S. Cl. 364—424.01 **22 Claims**



1. A method of providing a vehicle management computer system (VMS) for an X-Wing type aircraft controlling many mechanical subsystems and functions including flight control functions, compressor and pneumatic distribution control, rotor conversion control, rotor vibration alleviation and self-test, comprising the following steps:

(a) segregating flight critical and mission critical factors;

(b) centralizing the computation of functions utilized by several mechanical subsystems, including air data and rotor speed;

(c) integrating the flight control functions, the compressor and pneumatic distribution control, the rotor conversion control, rotor vibration alleviation and self-test to be under the control of a single integrated flight control computer system contained within the same hardware unit; and

(d) providing redundancy for the integrated computer system with multiple number of like flight control computer systems contained in separate hardware units, at least some of which likewise include the integration step of step "c," and providing multiple redundancy for backing up flight critical factors and mission critical factors, with the redundancy of the former being greater than the latter;

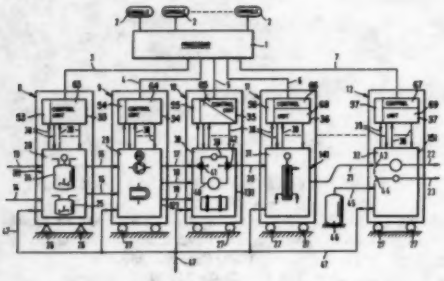
wherein in step "c," in the controlling of the self-test, there is included the following step(s):

allowing conversion of the rotor from one state to the opposite state only after a self-test is initiated, which test is initiated when a switch is activated under a pilot's manual control, and in the self-test, assessing whether the sensors and actuators required for conversion to the opposite state are operational to effect a conversion to the opposite state.

4,965,880
PRODUCTIO INSTALLATION FOR THE MANUFACTURE OF A PRODUCT

Pierre Petitjean, Arisdorf, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 6, 1988, Ser. No. 215,844
Claims priority, application Switzerland, Jul. 15, 1987, 2698/87
Int. Cl.[5] G05B *19/00*
U.S. Cl. 364—468 15 Claims



1. Production installation for the manufacture of a product in a multistage process, comprising

(A) a process guiding system having input/output consoles and, connected to the consoles, a process computer for monitoring and controlling said multistage process for the manufacture of said product; and

(B) at least two modular units for conducting the respective stages of said process:

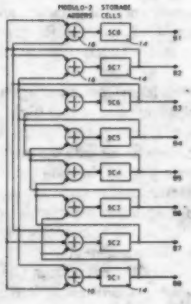
(a) each of said modular units comprising production apparatus, instrumentation, tubing, electrical wiring, sensors, actuators and a control unit, connected to said sensors and actuators, for communicating with said process guiding system; and

(b) at least one of said modular units being detachable from the rest of said production installation and transportable.

4,965,881
LINEAR FEEDBACK SHIFT REGISTERS FOR DATA SCRAMBLING

James E. Dilley, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 7, 1989, Ser. No. 403,979
Int. Cl.[5] H04L *9/00*; G11C *19/00*
U.S. Cl. 380—50 14 Claims



1. A linear feedback shift register for operation in accordance with a generating polynomial of order n corresponding to an n by n transition matrix T, the shift register comprising:

k storage cells, where k and n are integers and k>n;

means for supplying a clock signal simultaneously to all of the storage cells;

means for deriving a k-bit word from outputs of the storage cells; and

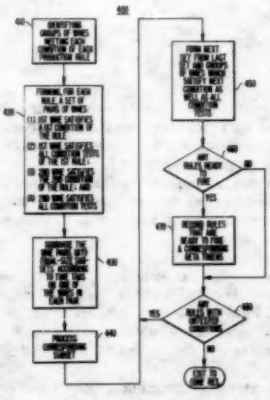
linear feedback means coupling inputs of the storage cells to respective outputs of the storage cells in accordance with a k by k transition matrix T', each row and column of the transition matrix T' corresponding to a storage cell, binary 1's in each row of the transition matrix T' indicating that that row's storage cell's input is responsive to a storage cell's output as represented by the column in which the binary 1's appear;

where the matrix T' is the k-th power of a k by k matrix T'' consisting of the n by n matrix T extended by an additional k-n rows and columns, with each of the additional rows n+1 to k representing a further connection of an input of a respective storage cell to the output of the storage cell corresponding to the preceding row of the matrix.

4,965,882
METHOD FOR OPERATING A PARALLEL PROCESSING SYSTEM AND RELATED APPARATUS

William Barabash, Acton, and William S. Yerazunis, Hudson, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 1, 1987, Ser. No. 103,364
Int. Cl.[5] G06F *15/18, 15/16*
U.S. Cl. 364—513 40 Claims



1. A method for operating a parallel processing system having a plurality of processors, said processors having access to working memory elements to be examined and said processors implementing production rules specifying operations to be performed when a series of conditions are satisfied by specified ones of the working memory elements, the method comprising the steps of:

identifying, by each said processor substantially simultaneously, groups of said working memory elements, each of said groups corresponding to a unique one of the conditions of each of said production rules such that all of the elements in each group satisfy the corresponding condition;

forming, by each said processor substantially simultaneously and from said groups of working memory elements, first sets of pairs of said working memory elements, each of said first sets corresponding to a unique one of said production rules the elements in each of the pairs in said first sets respectively satisfying first and second conditions of the corresponding production rule;

forming, by each said processor substantially simultaneously and from said groups of working memory elements, sequences of next sets of said working elements, each said sequence being associated with at least one of said production rules such that each said next set in each said sequence corresponds to a next one of the series of conditions for the associated production rules, each of said next sets in each of said sequences containing working memory elements contained in a prior set in that sequence as well as working memory elements from said groups which satisfy the corresponding condition in the associated production rule;

subdividing, by each said processor substantially simultaneously, a selected one of said first sets or said next sets into N unique, nonoverlapping subsets where N is no greater than the number of processors, each of said subsets corresponding to one of said processors, each said processor only forming the next sets in each sequence succeeding said corresponding subset; and

performing all of the operations specified by one of the production rules for which all conditions have been satisfied.

4,965,883

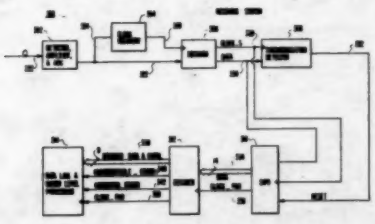
METHOD AND APPARATUS FOR TRANSMITTING AND RECEIVING CHARACTERS USING A BALANCED WEIGHT ERROR CORRECTING CODE

Alan Kirby, Hollis, N.H., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 24, 1988, Ser. No. 235,870

Int. Cl.[5] G06F *11/10*

U.S. Cl. 371—52 **42 Claims**



1. A distributed processing system for transmitting data blocks from a transmitting station to a receiving station, each data block representing one of a plurality of code words encoding one of a plurality of characters, the distributed processing system comprising:

encoding means in the transmitting station for converting each of the plurality of characters to a predetermined corresponding one of a plurality of balanced weight fixed distance code words;

transmitting means for transmitting said code words as data blocks;

receiving means for receiving said transmitted data blocks; and

decoding means in the receiving station for converting each of the received data blocks to the ones of said characters corresponding to the code words represented by said received data blocks.

4,965,884

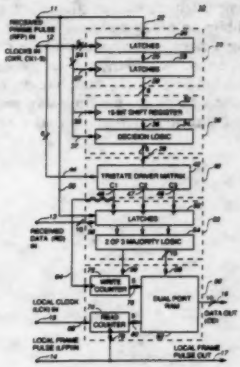
DATA ALIGNMENT METHOD AND APPARATUS

David K. Okura, Nepean; John A. Gauthier, Kanata; Trevor R. Hill, Nepean, all of Canada, and Simon A. MacKenzie, Melbourne, Australia, assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 22, 1989, Ser. No. 440,157

Int. Cl.[5] H04L *7/00*

U.S. Cl. 375—106 **12 Claims**



1. A method for receiving parallel data signals and a frame pulse aligned with the data signals, comprising the steps of:

sampling the frame pulse using a plurality of clocks, each clock being phase shifted with respect to each other clock;

selecting a number of the plurality of clocks in dependence upon a predetermined value of the sampled frame pulse;

sampling the data signals using the selected clocks;

choosing a data sample representing a majority of the data samples to provide a sampled data signal; and

aligning the sampled data signal with a local frame pulse.

4,965,885

FILM CARRIER FOR ENDODONTIC DENTAL RADIOGRAPHS

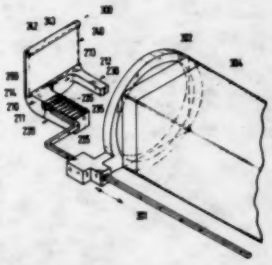
Andreas Fuhrmann, Bellmannstrasse 32, 2000 Hamburg 52, Fed. Rep. of Germany

Filed Aug. 19, 1987, Ser. No. 87,163

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1987, 8701308[U]

Int. Cl.[5] G03B *42/04*

U.S. Cl. 378—168 **2 Claims**



1. A film carrier for endodontic dental radiographs by a parallel comprising:

a plastic U-shaped molded member having a first leg form-

ing bite-one block, a second leg forming a contact holding block, and a web which connects said legs provided as a backplate which is at a right angle to a bite-on plane formed by the bite-on block, said backplate being provided so as to retain a dental x-ray film, said backplate includes a lower x-ray film bearing surface arranged so as to face the bite-on block and an upper edge bent slightly in a direction towards the bite-on block so as to form an x-ray film holding groove, said backplate being dimensioned larger than the x-ray film, said contact holding block having a length shorter than that of said bite-on block, said bite-on block and said contact holding block each having a square cross-section, the cross-section of said bite-on block being larger than the cross-section of said contact holding block, said bite-on block and said contact holding block having opposing wall faces which have curved transitional regions that extend towards a walls surface of said web connecting said bite-on block and said contact holding block, said bite-on block and said contact holding block each having an upper wall surface area in a common plane with the lower dental film bearing surface, said bite-on block having a free end and a bottom side which tapers from the free end toward said backplate in a conical manner so as to extend into a lower edge of said backplate which in turn extends into a bottom side wall surface of said contact holding block, said backplate being opaque to x-rays;

a guide rod detachably held on said bite on block by a plug-in connection; and

a sighting ring displaceable along said guide rod and having a mounting support so that the film carrier is fixable to a barrel of a dental x-ray apparatus.

DESIGN PATENTS

GRANTED OCT. 23, 1990

ERRATA

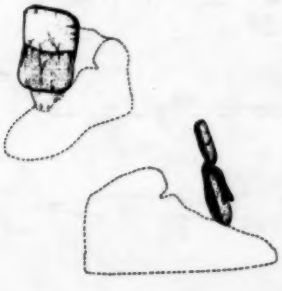
For CLASS	See PATENT NO.
D28-064	311,595

DESIGNS

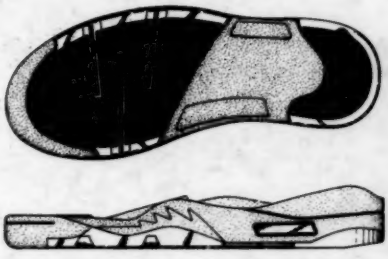
OCTOBER 23, 1990

311,445
DISPOSABLE BIB FOR MOTOR VEHICLE OCCUPANTS
Frank G. Dawahare, 3407 Warner Ave., Louisville, Ky. 40207
Filed Jun. 21, 1989, Ser. No. 369,675
Term of patent 14 years
U.S. Cl. D2—229

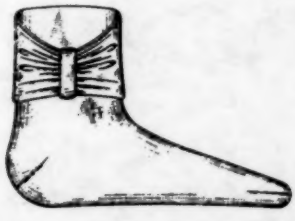
311,446
ELEMENT OF A SHOE UPPER
Bernard A. Merritt, Billericay, England, assignor to Reebok International Ltd., Stoughton, Mass.
Filed Dec. 7, 1989, Ser. No. 447,242
Term of patent 14 years
U.S. Cl. D2—315



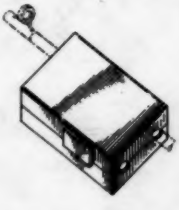
311,447
CUP SHAPED SOLE
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc. and Nike International, Ltd., both of Beaverton, Oreg.
Filed Sep. 14, 1989, Ser. No. 407,020
Term of patent 14 years
U.S. Cl. D2—320



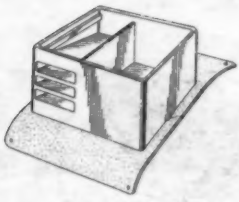
311,448
SOCK
Jill L. Kenna, Bloomington, and Thomas R. Freeman, St. Paul, both of Minn., assignors to Summerfield Industries, Inc., Spring Lake Park, Minn.
Filed May 17, 1987, Ser. No. 50,136
Term of patent 14 years
U.S. Cl. D2—331

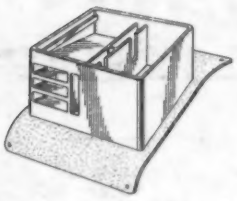


311,449
COMBINED FISHING ROD HOLDER AND LURE BOX
Gerald B. Paschal, 403 Helena Cir., Littleton, Colo. 80124
Filed Jun. 26, 1987, Ser. No. 66,647
Term of patent 14 years
U.S. Cl. D3—38



311,450
VEHICLE CONSOLE MAP ORGANIZER AND STORAGE UNIT
Jack Burns, 11 N. John St., Pearl River, N.Y. 10965
Filed Dec. 29, 1987, Ser. No. 139,052
Term of patent 14 years
U.S. Cl. D3—40



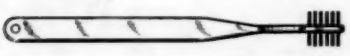


311,451
KEYCHAIN
David M. Chan, 401 E. Mission Dr., San Gabriel, Calif. 91776
Filed Aug. 8, 1988, Ser. No. 229,487
Term of patent 14 years
U.S. Cl. D3—62

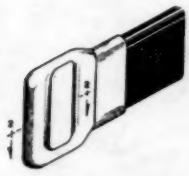
311,452
DUFFEL BAG WITH SIDE POCKETS
Bernard Ebret, Barr, France, assignor to Atol Design, Inc., New York, N.Y.
Filed Mar. 24, 1987, Ser. No. 29,706
Term of patent 14 years
U.S. Cl. D3—71

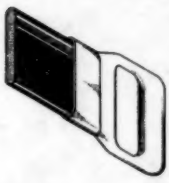
311,453
BODY ATTACHABLE BAG
James G. Rice, 59 Quail Ridge, Greenville, N.C. 27834
Filed Jul. 9, 1986, Ser. No. 883,832
Term of patent 14 years
U.S. Cl. D3—100

311,454
TOOTHBRUSH
Michael P. Rethman, 12117 Blue Flag Way, Colombia, Md. 21044
Filed Jun. 27, 1988, Ser. No. 211,666
Term of patent 14 years
U.S. Cl. D4—106

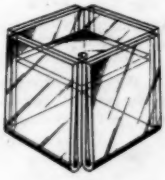


311,455
PAINTBRUSH
John B. Snipes, 2706 Hunting Hill La., Decatur, Ga. 30033
Filed Dec. 16, 1987, Ser. No. 134,446
Term of patent 14 years
U.S. Cl. D4—132





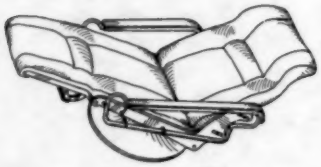
311,456
HANGING PICTURE FRAME
A. Joel Grossbart, 1207 Ragley Hall, Atlanta, Ga. 30319
Filed Aug. 15, 1988, Ser. No. 231,993
Term of patent 14 years
U.S. Cl. D6—301



311,457
CLIP-ON PICTURE HOLDER
Harvey Shapiro, 55 Claverach Dr., Clayton, Mo. 63105
Filed May 2, 1988, Ser. No. 189,518
Term of patent 14 years
U.S. Cl. D6—314

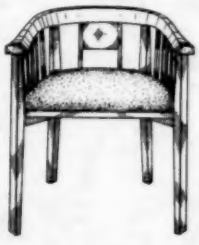
311,458
SCARF HANGER
Ann M. La Croix, 14 Elm Hill Dr., Rye Brook, N.Y. 10573
Filed Mar. 6, 1989, Ser. No. 320,241
Term of patent 14 years
U.S. Cl. D6—315

311,459
ADJUSTABLE CHAIR
Erik F. Holmström, Vasaesplanaden 2 D 84, SF-65120 Vasa, Finland
Filed Aug. 31, 1987, Ser. No. 91,211
Term of patent 14 years
U.S. Cl. D6—367

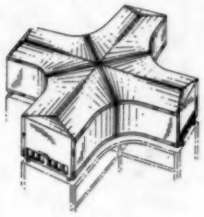


311,460
CHAIR
Michael W. Greene, Incline Village, Nev., assignor to Little Lake Industries, Inc., Incline Village, Nev.
Filed Jun. 12, 1987, Ser. No. 62,545
Term of patent 14 years
U.S. Cl. D6—379

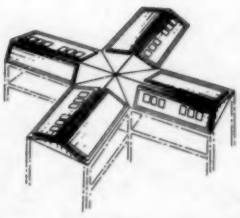
311,461
CHAIR
Gary Lee, and Melvin Hamilton, both of Chicago, Ill., assignors to Helikon Furniture Company, Taftville, Conn.
Filed Mar. 25, 1987, Ser. No. 30,816
Term of patent 14 years
U.S. Cl. D6—380



311,462
HEADER FOR A MERCHANDISING DISPLAY STAND OR THE LIKE
William Prendergast, Park Ridge, and John G. Dewees, Morristown, both of N.J., assignors to Philip Morris Incorporated, New York, N.Y.
Filed Dec. 5, 1986, Ser. No. 938,778
Term of patent 14 years
U.S. Cl. D6—455



311,463
HEADER FOR A MERCHANDISING DISPLAY STAND OR THE LIKE
William Prendergast, Park Ridge, N.J., assignor to Philip Morris Incorporated, New York, N.Y.
Filed Dec. 5, 1986, Ser. No. 938,780
The portion of the term of this patent subsequent to Aug. 21, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—455



311,464

MERCHANDISING DISPLAY STAND OR THE LIKE

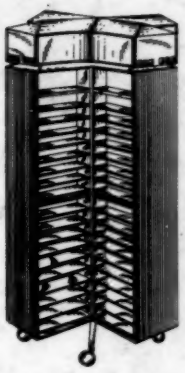
William Prendergast, Park Ridge, N.J., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Dec. 5, 1986, Ser. No. 938,774

The portion of the term of this patent subsequent to Oct. 23, 2004, has been disclaimed.

Term of patent 14 years

U.S. Cl. D6—461



311,465

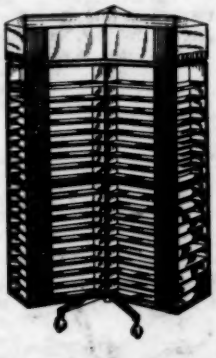
MERCHANDISING DISPLAY STAND OR THE LIKE

William Prendergast, Park Ridge, N.J., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Dec. 5, 1986, Ser. No. 938,744

Term of patent 14 years

U.S. Cl. D6—461



311,466

MERCHANDISING DISPLAY STAND OR THE LIKE

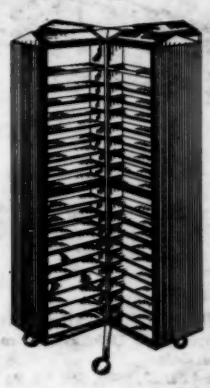
William Prendergast, Park Ridge, N.J., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Dec. 5, 1986, Ser. No. 938,775

The portion of the term of this patent subsequent to Oct. 9, 2004, has been disclaimed.

Term of patent 14 years

U.S. Cl. D6—461



311,467

MERCHANDISING DISPLAY STAND OR THE LIKE

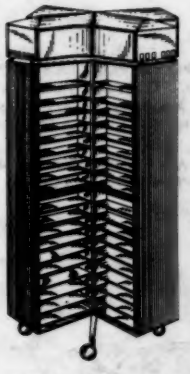
William Prendergast, Park Ridge, and John G. Dewees, Morristown, both of N.J., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Dec. 5, 1986, Ser. No. 938,776

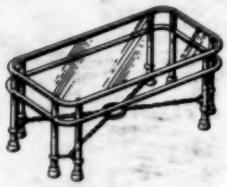
The portion of the term of this patent subsequent to Oct. 23, 2004, has been disclaimed.

Term of patent 14 years

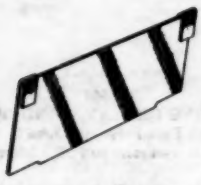
U.S. Cl. D6—461



311,468
TABLE
Leo Martin, 260 NW. 25th St., Miami, Fla. 33127
Continuation of Ser. No. 119,408, Nov. 12, 1987, abandoned. This application Jun. 27, 1988, Ser. No. 174,334
Term of patent 14 years
U.S. Cl. D6—487

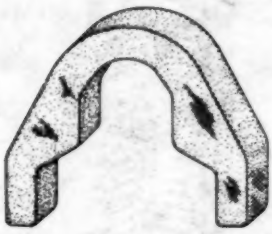


311,469
SHELF BIN RETAINING WALL
Byron R. Miller, Springboro, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Filed Jan. 5, 1987, Ser. No. 917
Term of patent 14 years
U.S. Cl. D6—491



311,470
LEG SUPPORT CUSHION
Delos M. Cosgrove, III, Hunting Valley; Lawrence E. Forbes, Avon Lake, and Anthony Rodono, Cleveland Heights, all of Ohio, assignors to The Cleveland Clinic Foundation, Cleveland, Ohio
Filed Aug. 24, 1987, Ser. No. 88,839
Term of patent 14 years
U.S. Cl. D6—601

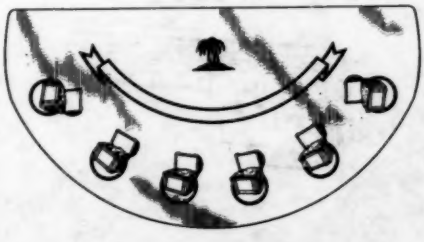
311,471
INFANT HEAD SUPPORT FOR USE WITH INFANT RETAINING DEVICES
Steven B. Rosen, 28747 Mauch St., Saugus, Calif. 91350
Filed Jul. 16, 1987, Ser. No. 74,331
Term of patent 14 years
U.S. Cl. D6—601



311,472
COMBINED PILLOW, CASSETTE PLAYER AND SPEAKERS
Michael H. Giles, 13817 Castle Blvd., Silver Spring, Md. 20904
Filed Jan. 27, 1988, Ser. No. 148,240
Term of patent 14 years
U.S. Cl. D6—601

311,473
BEACH BLANKET
Anthony Vrabel, 282 Cameo Ct., East Meadow, N.Y. 11554
Filed Jul. 21, 1986, Ser. No. 889,349
Term of patent 14 years
U.S. Cl. D6—603

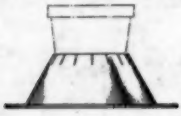
311,474
GAME TABLE COVERING
Benjamin F. Hoffman, Las Vegas, Nev., assignor to Caribbean Stud Enterprises, Inc., Las Vegas, Nev.
Filed Mar. 31, 1988, Ser. No. 176,384
Term of patent 14 years
U.S. Cl. D6—318

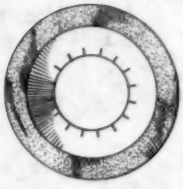


311,475
VACUUM PITCHER
Jean-Jacques Durand, LaBute, 62510, Arques, France
Filed Mar. 7, 1988, Ser. No. 164,718
Term of patent 14 years
U.S. Cl. D7—317

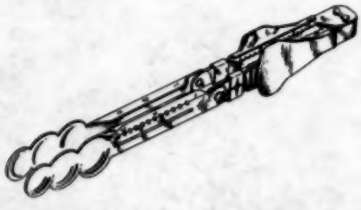
311,476
PICNIC BOX OR THE LIKE
Daisuke Kumakura, Niigata, Japan, assignor to Twin Bird Industrial Co., Ltd., Japan
Filed May 4, 1987, Ser. No. 46,283
Term of patent 14 years
U.S. Cl. D7—605

311,477
STABILIZING CUP HOLDER
Taria A. Fallgatter, and James C. Fallgatter, both of 2045 Sea Cove La., Costa Mesa, Calif. 92627
Filed May 15, 1987, Ser. No. 50,219
Term of patent 14 years
U.S. Cl. D7—619

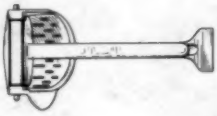




311,478
TONGS AND SIMILAR ARTICLE
Theodore Dali, 289 Bayview Ct., Bloomingdale, Ill. 60108
Filed Mar. 29, 1988, Ser. No. 174,677
Term of patent 14 years
U.S. Cl. D7—686

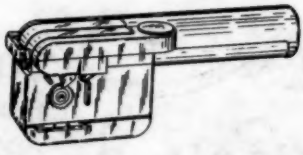


311,479
HAND OPERATED FRUIT JUICER
Jaime Camara, Mexico, Mexico, assignor to Avangard Trading Company, Houston, Tex.
Filed Jun. 13, 1988, Ser. No. 205,912
Term of patent 14 years
U.S. Cl. D7—666



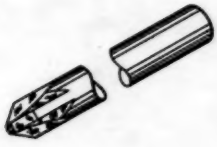
311,480
STAKE PULLER
William C. Stamps, 660 Rd. #69, Chelsea, Ala. 35403
Filed Sep. 14, 1988, Ser. No. 244,252
Term of patent 14 years
U.S. Cl. D8—14

311,481
CAN-OPENER
Jan F. Van Asten, Klagenfurt, Austria, assignor to U.S. Philips Corporation, New York, N.Y.
Filed May 17, 1988, Ser. No. 194,776
Claims priority, application United Kingdom, Nov. 23, 1987, 1046549
Term of patent 14 years
U.S. Cl. D8—36

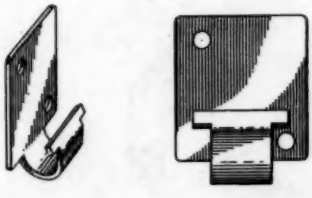


311,482
COMBINED FIFTH WHEEL PIN PULLER AND TIRE KNOCKER FOR TRACTOR TRAILER HITCH ASSEMBLIES
James F. Morton, 3800 Cheryl St., Bucyrus, Ohio 44820
Filed Feb. 10, 1988, Ser. No. 155,002
Term of patent 14 years
U.S. Cl. D8—51

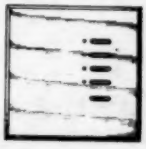
311,483
SCREW DRIVER BIT
Mario W. Espin, Charlotte, N.C., assignor to Helen P. Espin, Charlotte, N.C.
Filed Nov. 14, 1986, Ser. No. 930,868
Term of patent 14 years
U.S. Cl. D8—86

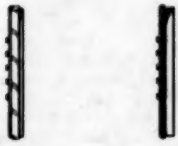


311,484
DROP CABLE BRACKET
Isaac Sachs, 1240 Ridgewood Drive, Chomedey, Laval Quebec, Canada H7W 1L3
Filed Dec. 23, 1987, Ser. No. 137,012
Term of patent 14 years
U.S. Cl. D8—367



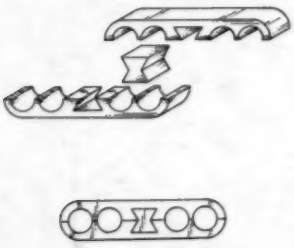
311,485
LIGHTING CONTROL FACEPLATE
Elliot G. Jacoby, Glenside, and Rita R. Swartvagher, Coopersburg, both of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.
Filed Aug. 9, 1988, Ser. No. 230,532
Claims priority, application United Kingdom, Feb. 26, 1988, 1048793
Term of patent 14 years
U.S. Cl. D8—353





311,486
SPOOL HUB CONNECTOR UNIT
Joe G. Hickman, Box 355, Wolcott, Ind. 47995
Filed Feb. 6, 1987, Ser. No. 11,705
Term of patent 14 years
U.S. Cl. D8—358

311,487
WIRE SEPARATOR STRUCTURE
Richard B. Platt, 381 Country Club La., Detroit, Mich. 48236
Filed Feb. 26, 1987, Ser. No. 19,951
Term of patent 14 years
U.S. Cl. D8—396



311,488
MICROWAVEABLE FOOD PACKAGE
Duane M. Regenscheid, Austin, Minn., assignor to Geo. A. Hormel & Co., Austin, Minn.
Filed Oct. 7, 1988, Ser. No. 254,885
Term of patent 14 years
U.S. Cl. D9—345

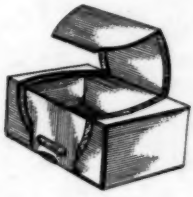
311,489
BOTTLE
Kenneth E. Holmes, Garden Grove, Calif., assignor to Mothers Polishes Waxes Cleaners, Huntington Beach, Calif.
Filed Oct. 24, 1988, Ser. No. 261,340
Term of patent 14 years
U.S. Cl. D9—367

311,490
CONTAINER
Jean-Jacques Vola, 6, Allee des Lauriers, 91370 Verrieres-Le-Buisson, France
Filed Sep. 8, 1988, Ser. No. 242,275
Term of patent 14 years
U.S. Cl. D9—370

311,491
COMBINED BOTTLE AND STOPPER
Francois Bompard, Boulogne-Billancourt, France, assignor to The 501 Laboratoires de Biologie Vegetale Yves Rocher, La Gacilly, France
Filed Jun. 9, 1988, Ser. No. 204,408
Claims priority, application France, Dec. 10, 1987, 87 7420
Term of patent 14 years
U.S. Cl. D9—385

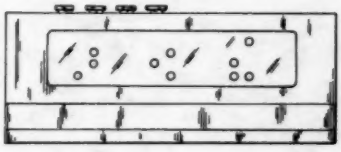
311,492
PERFUME BOTTLE
Bert Pearse, Huntington Beach, Calif., assignor to Giorgio, Inc., Santa Monica, Calif.
Filed Nov. 18, 1988, Ser. No. 273,004
Term of patent 14 years
U.S. Cl. D9—386

311,493
CARTON
Larry L. Boone, Ruther Glen, Va., assignor to Westvaco Corporation, New York, N.Y.
Filed Jun. 14, 1988, Ser. No. 207,057
Term of patent 14 years
U.S. Cl. D9—416



311,494
BOTTLE CLOSURE
Gerald Zinnbauer, Bay Village, Ohio, assignor to Kardon Industries, Inc., Philadelphia, Pa.
Filed Aug. 24, 1987, Ser. No. 88,789
Term of patent 14 years
U.S. Cl. D9—448

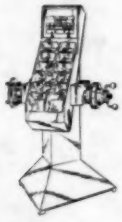
311,495
CLOCK
Rudy Krolopp, Barrington Hills, Ill., assignor to Cimtron Corp., Wood Dale, Ill.
Filed May 15, 1987, Ser. No. 51,031
Term of patent 14 years
U.S. Cl. D10—15



311,496
COMBINED TIMER AND CLIP FOR PILOTS
Cyrous Khavari, P.O. Box 24908, Denver, Colo. 80224
Filed Oct. 19, 1987, Ser. No. 109,611
Term of patent 14 years
U.S. Cl. D10—31

311,497
CABLE CONFIGURATION ANALYZER AND TESTER
Thomas E. Vincent, Sr., 5232 Skiles St., Kansas City, Mo. 64129
Filed Dec. 8, 1986, Ser. No. 939,767
Term of patent 14 years
U.S. Cl. D10—75

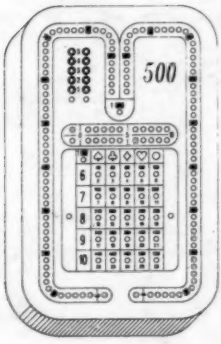
311,498
BALANCING MACHINE FOR VEHICLE WHEELS
Stanislaus J. B. Golüke, Pr. Beatrixstraat 66a, 4024 HN Eck en Wiel, Netherlands
Filed Sep. 18, 1987, Ser. No. 98,123
Claims priority, application Int'l Pat. Institute, Mar. 20, 1987, 61964-00
Term of patent 14 years
U.S. Cl. D10—82



311,499
TIP-UP SIGNAL FOR FISHING
Robert L. Mason, 2720 McDivitt Rd., Madison, Wis. 53713
Filed Oct. 19, 1988, Ser. No. 259,694
Term of patent 14 years
U.S. Cl. D10—104

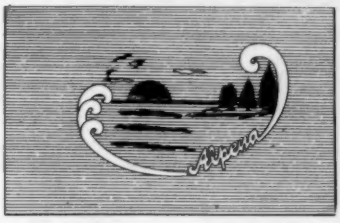
311,500
AUTO ALARM
Lowell C. Schirado, Grand Rapids, Mich., assignor to Amway Corporation, Ada, Mich.
Filed Jul. 25, 1988, Ser. No. 224,127
Term of patent 14 years
U.S. Cl. D10—106

311,501
CARD GAME SCOREBOARD
André Defayette, P.O. Box 415, Cantley, Quebec, Canada J0X 1L0, and Yves Milette, 2885, de Strasbourg, Laval, Quebec, Canada H7K 3E8
Filed May 5, 1986, Ser. No. 859,733
Claims priority, application Canada, Feb. 24, 1986, 24-02-86-5
Term of patent 14 years
U.S. Cl. D10—46.1



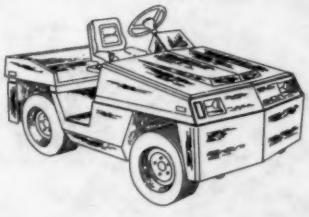
311,502
EARRING
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Dec. 14, 1987, Ser. No. 132,107
Claims priority, application Italy, Jun. 22, 1987, 35871/87[U]
Term of patent 14 years
U.S. Cl. D11—75

311,503
FLAG
Donna Bordewyk, Ossineke, Mich., assignor to City of Alpena, Alpena, Mich.
Filed May 15, 1989, Ser. No. 354,686
Term of patent 14 years
U.S. Cl. D11—172

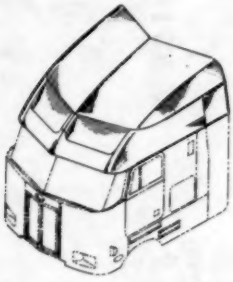


311,504
MEDALLION
Patrick H. De Frahan, Brussels, Belgium, assignor to Innovative Trading & Services S.A., Brussels, Belgium
Filed Jun. 29, 1988, Ser. No. 213,983
Claims priority, application France, May 24, 1988, DM/011006
The portion of the term of this patent subsequent to Oct. 16, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—79

311,505
TOW TRACTOR
Jay J. Reinhart, Battle Creek, Mich., assignor to Clark Equipment Company, South Bend, Ind.
Filed Jan. 15, 1988, Ser. No. 144,391
Term of patent 14 years
U.S. Cl. D12—14

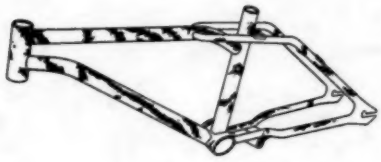


311,506
INTEGRAL TRUCK CAB ROOF, FAIRING AND SUN VISOR UNIT
Huston Marlowe, Orinda; Virgil E. Pound, San Jose, and Michikazu Tao, Castro Valley, all of Calif., assignors to PAC-CAR Inc., Del.
Filed Sep. 15, 1988, Ser. No. 245,064
Term of patent 14 years
U.S. Cl. D12—96



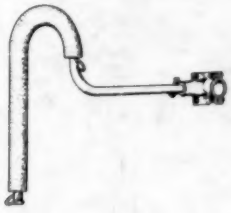
311,507
MOTORCYCLE
Chiharu Sasaki, Tokyo; Kazuya Kurita, Gyoda, and Tomonori Mogi, Tsurugashima, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 16, 1988, Ser. No. 169,193
Claims priority, application Japan, Sep. 14, 1987, 62-38895
Term of patent 14 years
U.S. Cl. D12—110

311,508
BICYCLE FRAME
William J. Rieger, Dayton, and Joseph F. Skrivan, Middletown, both of Ohio, assignors to Huffy Corporation, Miamisburg, Ohio
Filed Jun. 24, 1988, Ser. No. 210,957
Term of patent 14 years
U.S. Cl. D12—111

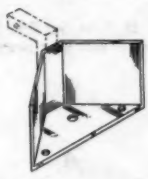


311,509
PATIENT'S CHAIR
Raymond A. Fallor, Seville, and Eugene P. Hayton, Medina, both of Ohio, assignors to Hausted, Inc., Medina, Ohio
Filed Sep. 4, 1987, Ser. No. 93,896
Term of patent 14 years
U.S. Cl. D12—131

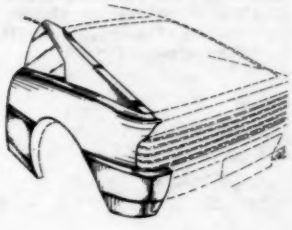
311,510
BICYCLE LUGGAGE RACK
Stephen W. Royce, P.O. Box 202, Palm Beach, Qld. 4221, Australia
Filed May 13, 1988, Ser. No. 193,997
Claims priority, application Australia, Nov. 17, 1987, 4236/87
Term of patent 14 years
U.S. Cl. D12—158



311,511
TRAILER HITCH GUIDE
Carl E. Craig, 3036 Walnut Ave., Grand Junction, Colo. 81504
Filed Jun. 13, 1988, Ser. No. 205,797
Term of patent 14 years
U.S. Cl. D12—162



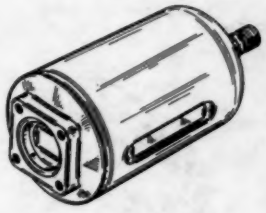
311,512
AUTOMOBILE REAR QUARTER PANEL EXTERIOR SURFACE
Leonardo Fioravanti, Moncalieri, Italy, assignor to Ferrari Societa Per Azioni Esercizio Fabriche Automobile, Modena, Italy
Division of Ser. No. 912,492, Sep. 29, 1986. This application Mar. 22, 1989, Ser. No. 327,185
Claims priority, application Italy, Mar. 28, 1986, 65206/86
Term of patent 14 years
U.S. Cl. D12—196



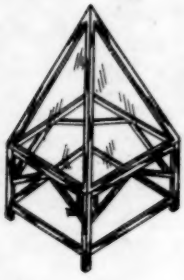
311,513
TORQUE EQUALIZER OF A BOAT STABILIZER
Arthur R. Templeman, Overland Park, Kans., assignor to Marine Dynamics, Inc., Overland Park, Kans.
Filed Jul. 13, 1988, Ser. No. 220,093
Term of patent 14 years
U.S. Cl. D12—317

311,514
LIGHT AIR PLANE
Isao Sano, and Michiyoshi Shiraishi, both of Tokyo, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed May 3, 1988, Ser. No. 189,747
Claims priority, application Japan, Mar. 31, 1988, 63-13038
Term of patent 14 years
U.S. Cl. D12—337

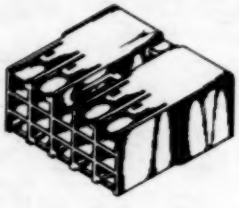
311,515
CONVERTER HOUSING
Akio Itoh; Makoto Hirota, and Atsushi Nagano, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Nov. 14, 1986, Ser. No. 931,783
Claims priority, application Japan, May 15, 1986, 61-18594
Term of patent 14 years
U.S. Cl. D13—101



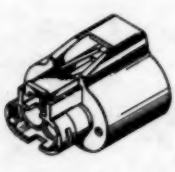
311,516
SOLAR GENERATOR
Herbert A. Geisler, Jr., Rte. #2—Box 27E, Decaturville, Tenn. 38329
Filed Apr. 22, 1988, Ser. No. 184,718
Term of patent 14 years
U.S. Cl. D13—102



311,517
HOUSING FOR AN ELECTRICAL CONNECTOR
Isao Kameyama, and Akira Maeda, both of Kosai, Japan, assignors to Yazaki Corporation, Japan
Filed Oct. 30, 1987, Ser. No. 114,827
Claims priority, application Japan, Apr. 30, 1987, 62-016646
Term of patent 14 years
U.S. Cl. D13—146

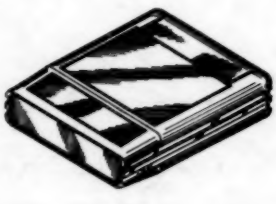


311,518
HOUSING FOR AN ELECTRICAL CONNECTOR
Katsutoshi Kuzuno; Shigeo Ishizuka; Hiroshi Watanabe, and Kazuaki Sakurai, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan
Filed May 10, 1988, Ser. No. 192,424
Claims priority, application Japan, Nov. 10, 1987, 62-45639; Dec. 4, 1987, 62-49577
Term of patent 14 years
U.S. Cl. D13—146



311,519
ILLUMINATED PEDESTAL MOUNTED MARINE POWER SOURCE
Patrick J. Reali, Bay Village, Ohio, assignor to Central Systems & Controls Corp., Westlake, Ohio
Filed Dec. 18, 1987, Ser. No. 134,899
Term of patent 14 years
U.S. Cl. D13—152

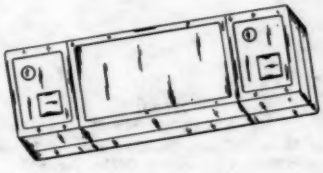
311,520
ELECTRONIC EQUIPMENT HOUSING
Donald L. Serio, Jr., Fontana, Calif., assignor to Serco Mold Inc., Covina, Calif.
Filed Oct. 11, 1988, Ser. No. 255,415
Term of patent 14 years
U.S. Cl. D13—184



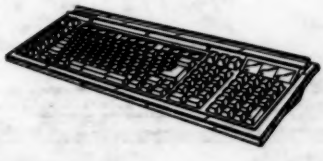
311,521
COMBINED EARPHONE AND MICROPHONE
Bjarne Jonsson, Bronshoj; Finn Jensen, Struer; Karsten Langhorn, Bronshoj, and Nikolai Bisgaard, Lyngby, all of Denmark, assignors to GN Netcom A/S, Copenhagen, Denmark
Filed Mar. 30, 1988, Ser. No. 176,386
Claims priority, application Denmark, Sep. 30, 1987, 1087/87
Term of patent 14 years
U.S. Cl. D14—226

311,522
DATA ENTRY TERMINAL
Leland W. Knight, Tempe, Ariz., assignor to Industrial Innovations, Inc., Scottsdale, Ariz.
Filed Jan. 31, 1989, Ser. No. 304,824
Term of patent 14 years
U.S. Cl. D14—106

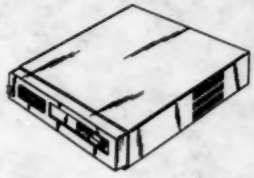
311,523
HOUSING FOR AN ELECTRONIC EDUCATIONAL VIDEO SYSTEM
David Cheung, Kowloon; Wu T. Yiu, Tai Po Plaza, and Donny Leung, Tai Koo Shing, all of Hong Kong, assignors to Video Technology Industries, Inc., Palatine, Ill.
Filed Apr. 15, 1988, Ser. No. 182,314
Claims priority, application United Kingdom, Oct. 28, 1987, 1045908
Term of patent 14 years
U.S. Cl. D14—100



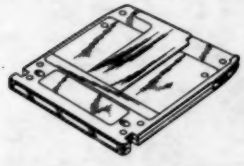
311,524
KEYBOARD
Arthur B. Lazere, Wayzata; William E. Ingold, Coon Rapids, and Bradley N. Kallaus, Robbinsdale, all, Minn., assignors to Northgate Computer Systems, Inc., Plymouth, Minn.
Filed Apr. 14, 1989, Ser. No. 338,136
Term of patent 14 years
U.S. Cl. D14—100



311,525
COMPUTER
Elton H. S. Fang, 4th Fl., No. 5, Alley 88, Lane 410, Pa Te Rd., Sec. 2, Taipei, Taiwan
Filed Jun. 15, 1988, Ser. No. 206,697
Term of patent 14 years
U.S. Cl. D14—100



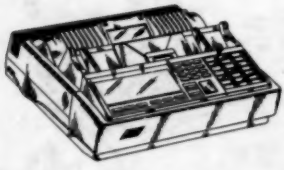
311,526
OPTI-MAGNETIC DISC CARTRIDGE
Tomohiko Hamada, Kanagawa, and Masaaki Sakai, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 18, 1988, Ser. No. 273,311
Claims priority, application Japan, May 20, 1988, 63-19899
Term of patent 14 years
U.S. Cl. D14—114



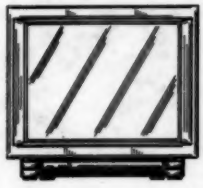
311,527
PORTABLE COMPUTER
Yukihiro Fujii; Yuichi Segawa, and Jyuji Kitakaze, all of Tottori, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan
Filed Apr. 27, 1988, Ser. No. 187,094
Claims priority, application Japan, Nov. 11, 1987, 62-46200
Term of patent 14 years
U.S. Cl. D14—106

311,528
ELECTRONIC COMPUTER
Yoshihiko Sugano, and Masahiko Tabuchi, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Aug. 3, 1987, Ser. No. 80,683
Claims priority, application Japan, Feb. 13, 1987, 62-5029
Term of patent 14 years
U.S. Cl. D14—106

311,529
FACSIMILE
Kunio Hara, Chiba, and Shinichi Hiroki, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Division of Ser. No. 126,679, Nov. 30, 1987, Pat. No. D. 306,018.
This application Oct. 10, 1989, Ser. No. 419,610
Claims priority, application Japan, Jun. 2, 1987, 62-22531
Term of patent 14 years
U.S. Cl. D14—118

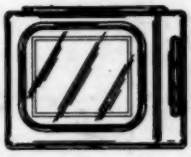


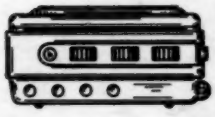
311,530
TELEVISION SET
Shigeru Kurozumi; Yoshito Fujii; Taisuke Saeki, and Hiroshi Kajimoto, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Sep. 9, 1987, Ser. No. 94,921
Term of patent 14 years
U.S. Cl. D14—126



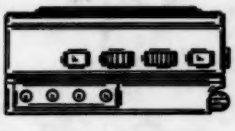
311,531
TELEVISION SET
Taisuke Saeki, and Osamu Shimizu, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Mar. 17, 1987, Ser. No. 27,021
Term of patent 14 years
U.S. Cl. D14—126

311,532
TELEVISION SET
Ryunosuke Kitagawa, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Mar. 17, 1987, Ser. No. 27,274
Term of patent 14 years
U.S. Cl. D14—126

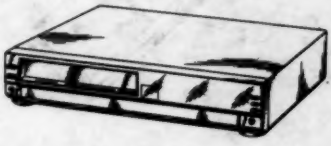




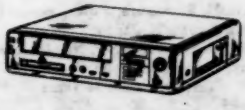
311,533
TELEVISION SET
Yoshihiro Yanagihara, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Mar. 17, 1987, Ser. No. 27,272
Term of patent 14 years
U.S. Cl. D14—126

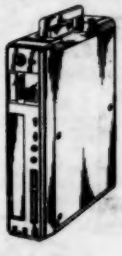


311,534
VIDEO TAPE RECORDER
Kimiyoshi Ban, Kasukabe, and Shinji Komabe, Kawaguchi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Aug. 16, 1988, Ser. No. 232,888
Claims priority, application Japan, Feb. 22, 1988, 63-6718
Term of patent 14 years
U.S. Cl. D14—135

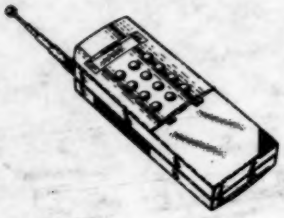


311,535
VIDEO TAPE PLAYER
Kouichi Maeyama, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 2, 1988, Ser. No. 241,091
Claims priority, application Japan, Mar. 4, 1988, 63-8630
Term of patent 14 years
U.S. Cl. D14—135





311,536
TRANSCEIVER
Behren K. Reeves, 4 Walking Woods Dr., Lake Oswego, Oreg. 97034; Henry Y. Chin, Beaverton, and Sohrab Vossoughi, Portland, both of Oreg., assignors to Behren K. Reeves, Lake Oswego, Oreg.
Filed Jun. 21, 1988, Ser. No. 209,353
Term of patent 14 years
U.S. Cl. D14—137



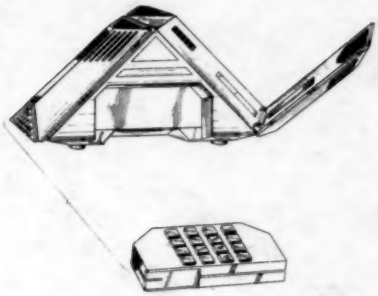
311,537
TAPE RECORDER
Masayoshi Tsuchiya, Tokyo, and Ichiro Hino, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Feb. 24, 1989, Ser. No. 315,042
Claims priority, application Japan, Aug. 26, 1988, 63-33671
Term of patent 14 years
U.S. Cl. D14—165

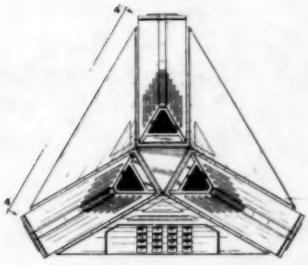
311,538
TAPE PLAYER
Masahiko Kobayashi, Kamakura, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 7, 1988, Ser. No. 241,143
Claims priority, application Japan, Apr. 1, 1988, 63-12891
Term of patent 14 years
U.S. Cl. D14—165

311,539
LOUDSPEAKER ENCLOSURE
Angelo Franzini, Viale Argonne, 36, and Eric Fricker, Via Savona, 17, both of Milan, Italy
Filed Apr. 2, 1986, Ser. No. 847,619
Claims priority, application Italy, Oct. 7, 1985, 23342[U]
Term of patent 14 years
U.S. Cl. D14—221

311,540
INFRARED ANTENNA
Gamini Wickrema, St. Laurent; Joseph DeSouza, Cote St. Luc, both of Canada, and Samuel Battaglia, Lakeville, Ill., assignors to Smoke Signal Data Systems, Inc., Lakeville, Ill.
Filed Jul. 25, 1988, Ser. No. 223,997
Term of patent 14 years
U.S. Cl. D14—233

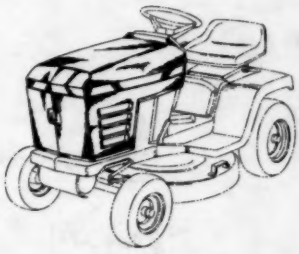
311,541
AUDIOCONFERENCE TELEPHONIC TERMINAL SET
Alain Carre, Paris, France, assignor to 501 France Cables ET Radio, Paris, France
Filed Apr. 26, 1988, Ser. No. 186,217
Claims priority, application France, Oct. 27, 1987, 87 6267
Term of patent 14 years
U.S. Cl. D14—240



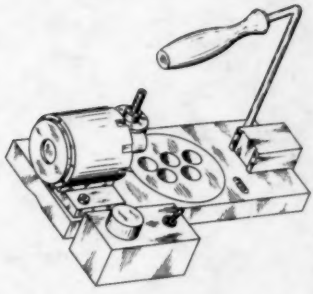


311,542
TELEPHONE HANDSET
Kevin J. Corneliess, 261 Barkley Ave., Clifton, N.J. 07011
Filed Apr. 14, 1989, Ser. No. 337,540
Term of patent 14 years
U.S. Cl. D14—248

311,543
ENGINE HOOD
James E. Hardzinski, Horicon; Daniel A. Sebben, West Bend; Kenneth E. Herren, Beaver Dam, all of Wis.; William E. Crookes, Waldwick, N.J., and Daniel R. Nickles, Monroe, N.Y., assignors to Deere & Company, Moline, Ill.
Filed Dec. 15, 1988, Ser. No. 285,881
Term of patent 14 years
U.S. Cl. D15—17

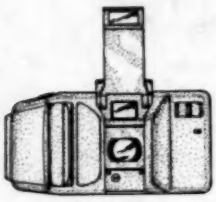


311,544
CUTTING TORCH GUIDE AND ALIGNMENT DEVICE
Edward H. Hayes, and James F. Walker, both of Guntersville, Ala., assignors to North Alabama Pipe Corporation, Guntersville, Ala.
Filed Apr. 4, 1988, Ser. No. 177,024
Term of patent 14 years
U.S. Cl. D15—127

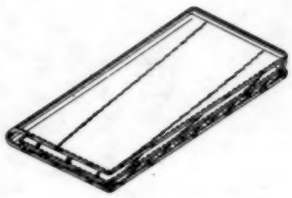


311,545
POWER BANDER
Paul R. Alm, Kansas City, Mo., assignor to Santa Fe Service & Sales, Inc., Kansas City, Mo.
Filed Jan. 11, 1988, Ser. No. 142,745
Term of patent 14 years
U.S. Cl. D15—145

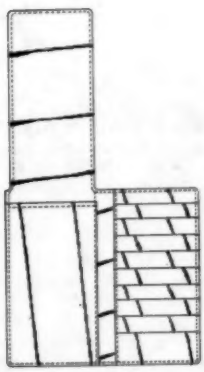
311,546
CAMERA WITH INTEGRAL FLASH UNIT
Bruce A. Leonard, Honeoye Falls, and David E. Hansen, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 13, 1987, Ser. No. 108,868
Term of patent 14 years
U.S. Cl. D16—209



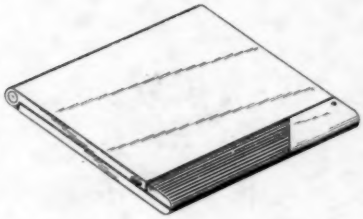
311,548
NOTEBOOK CASE
Theodore G. Thompson, Jr., 2918 W. Grove, Upper Marlboro, Md. 20772
Filed Oct. 24, 1988, Ser. No. 261,476
Term of patent 14 years
U.S. Cl. D19—26



311,547
ELECTRONIC CASH REGISTER
Isamu Yoshitake, Fuchu, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Dec. 22, 1988, Ser. No. 289,572
Term of patent 14 years
U.S. Cl. D18—4

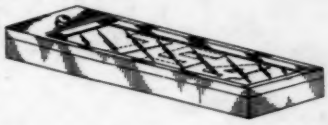


311,549
BINDING APPARATUS
Thomas T. Battisti, Buffalo Grove, Ill., assignor to General Binding Corporation, Northbrook, Ill.
Filed Mar. 22, 1988, Ser. No. 171,535
Term of patent 14 years
U.S. Cl. D19—26

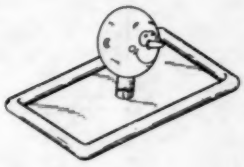


311,550
MARKING PEN
Katsuhiko Yazaki, Urawa, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan
Filed Oct. 28, 1987, Ser. No. 114,524
Claims priority, application Japan, May 29, 1987, 62-22307
Term of patent 14 years
U.S. Cl. D19—48

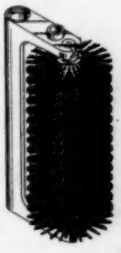
311,551
ILLUMINATED HOUSE NUMBER
Joey D. Hill, P.O. Box 56, Garrettsville, Ohio 44231, assignor to Joey Dean Hill, Garrettsville, Ohio
Filed Jun. 21, 1988, Ser. No. 184,171
Term of patent 14 years
U.S. Cl. D20—17



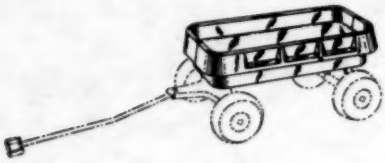
311,552
BATHTUB TOY
James Kubiatowicz, 1630 Rice Creek, Fridley, Minn. 55432
Filed Jun. 10, 1988, Ser. No. 204,772
Term of patent 14 years
U.S. Cl. D21—59



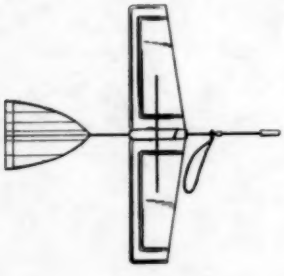
311,553
BRUSH FOR A TOY CAR WASH
Erling T. Dideriksen, Billund, Denmark, assignor to Interlego AG, Baar, Switzerland
Filed Dec. 2, 1987, Ser. No. 127,881
Term of patent 14 years
U.S. Cl. D21—59



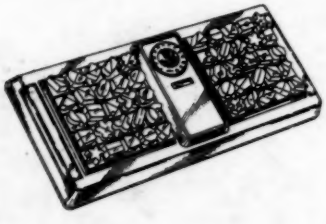
311,554
SIDE EXTENSION FOR A TOY WAGON
Richard A. Valiga, Bartlett, and Richard S. Hart, Elgin, both of Ill., assignors to Radio Flyer Inc., Chicago, Ill.
Filed Dec. 9, 1988, Ser. No. 283,932
Term of patent 14 years
U.S. Cl. D21—71



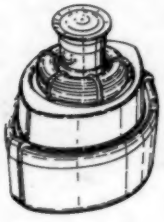
311,555
TOY KITE
John J. Kovats, Fernandina Beach, Fla., assignor to Space Adventures, Incorporated, Jacksonville, Fla.
Filed Dec. 27, 1988, Ser. No. 289,784
Term of patent 14 years
U.S. Cl. D21—89



311,556
MANIPULATIVE SKILLS GAME BOARD
Bruce P. Popek, South Windsor, and Bruce E. Foster, Plainville, both of Conn., assignors to Hasbro, Inc., Pawtucket, R.I.
Filed Aug. 3, 1987, Ser. No. 80,596
Term of patent 14 years
U.S. Cl. D21—105



311,557
TOY BOAT AND FIGURE
Harry S. Thomson, Richmond, and David Raffo, Hitchin, both of England, assignors to Monami Products Limited, Surrey, England
Filed Feb. 9, 1988, Ser. No. 154,121
Claims priority, application United Kingdom, Aug. 13, 1987, 1044181
Term of patent 14 years
U.S. Cl. D21—130



311,558
TOY SAIL BOAT
Adam Stern, 178 Wilmot Rd., New Rochelle, N.Y. 10804
Filed Nov. 13, 1987, Ser. No. 120,505
Term of patent 14 years
U.S. Cl. D21—130

311,559
MOTOR DRIVEN TOY CACTUS
Yasuta Satoh, Nagareyama, and Shinya Saitoh, Tokyo, both of Japan, assignors to Takara Co., Ltd., Tokyo, Japan
Filed Sep. 12, 1989, Ser. No. 406,131
Claims priority, application Japan, Jun. 12, 1989, 1-21653
Term of patent 14 years
U.S. Cl. D21—150

311,560
MOTOR DRIVEN TOY CACTUS
Yasuta Satoh, Nagareyama, and Shinya Saitoh, Tokyo, both of Japan, assignors to Takara Co., Ltd., Tokyo, Japan
Filed Sep. 12, 1989, Ser. No. 406,132
Claims priority, application Japan, Jun. 12, 1989, 1-21656
Term of patent 14 years
U.S. Cl. D21—150

311,561
DOLL CONFIGURATION
John M. Gorse, 21270 S. Lakeshore Blvd., Cleveland, Ohio 44123; Joseph T. Fontana, 7376 N. Chestnut Commons, Mentor, Ohio 44060, and Peggy A. Henderson, 38615 Rogers Rd., Willoughby Hills, Ohio 44094
Filed Jan. 27, 1988, Ser. No. 149,207
Term of patent 14 years
U.S. Cl. D21—166

311,562
DOLL
Henry S. Wolfe, Gulfport, Fla., assignor to Florida Pool Products, Inc., Clearwater, Fla.
Filed Nov. 2, 1987, Ser. No. 116,749
Term of patent 14 years
U.S. Cl. D21—168

311,563
DOLL
Henry S. Wolfe, Gulfport, Fla., assignor to Florida Pool Products, Inc., Clearwater, Fla.
Filed Nov. 2, 1987, Ser. No. 116,747
Term of patent 14 years
U.S. Cl. D21—168

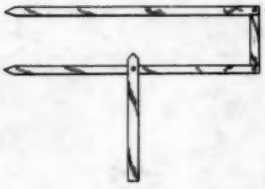
311,564
DOLL
Henry S. Wolfe, Gulfport, Fla., assignor to Florida Pool Products, Inc., Clearwater, Fla.
Filed Nov. 2, 1987, Ser. No. 116,750
Term of patent 14 years
U.S. Cl. D21—168

311,565
BASEBALL AND BAT RACK
Fred C. Buri, Jr., 7918 Hilshire Green, Houston, Tex. 77055, and Fred H. Buri, Sr., 7435 Laredo, Houston, Tex. 77020
Filed Feb. 29, 1988, Ser. No. 161,841
Term of patent 14 years
U.S. Cl. D21—223

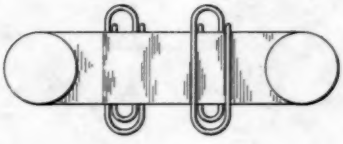
311,566
TOY HOUSE
David J. Cignako, Buffalo, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 11, 1988, Ser. No. 256,297
Term of patent 14 years
U.S. Cl. D21—114

311,567
GOLF BALL MARK REPAIR TOOL
Steven Tyrer, P.O. Box 824, Southold, N.Y. 11971
Filed Dec. 21, 1988, Ser. No. 289,576
Term of patent 14 years
U.S. Cl. D21—234

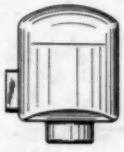
311,568
GOLF STROKE PRACTICE AID
Patrick Jacques, 702 Bidgewood Dr., Boca Raton, Fla. 33432
Filed Sep. 22, 1986, Ser. No. 910,188
Term of patent 14 years
U.S. Cl. D21—234



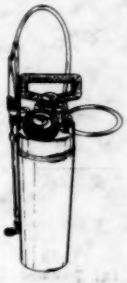
311,569
CLIP TRICK AMUSEMENT DEVICE
Mary S. Edwards, 4822-A N. Graham St., Charlotte, N.C. 28212
Filed Jun. 29, 1987, Ser. No. 67,461
Term of patent 14 years
U.S. Cl. D21—241



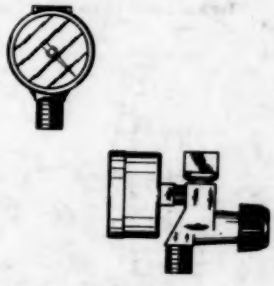
311,570
WATER FILTER CARTRIDGE HOUSING OR SIMILAR ARTICLE
Keith F. Woodruff, Mountainside, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Filed Jun. 7, 1988, Ser. No. 203,205
Term of patent 14 years
U.S. Cl. D23—209



311,571
HAND SPRAYER
Patrick J. Ballu, Reims, France, assignor to TECNOMA, France
Filed Jul. 13, 1988, Ser. No. 218,079
Claims priority, application France, Jan. 25, 1988, 88 0423; Jan. 25, 1988, 88 0424
Term of patent 14 years
U.S. Cl. D23—225

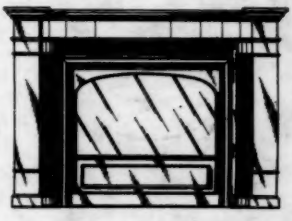


311,572
COMBINED VALVE AND GAUGE
Marvin D. Burns, Millbury, Ohio, assignor to Champion Spark Plug Company, Toledo, Ohio
Filed Feb. 17, 1987, Ser. No. 15,181
Term of patent 14 years
U.S. Cl. D23—235



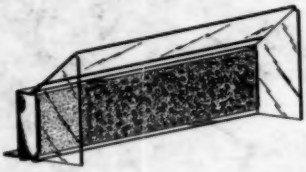
311,573
TRANSISTION PIPE ADAPTER
Will A. Lewis, 408 Lucust Ave., SE., Huntsville, Ala. 35801
Filed May 27, 1986, Ser. No. 867,397
Term of patent 14 years
U.S. Cl. D23—262

311,574
FIREPLACE FRONT
Duncan C. Syme, Norwich, and Vance R. Smith, Brookfield, both of Vt., assignors to Vermont Castings, Inc., Randolph, Vt.
Filed Mar. 23, 1988, Ser. No. 172,126
Term of patent 14 years
U.S. Cl. D23—345



311,575
AIR CONDITIONER
Anthony D. Kearney, Henley Beach, and Gilbert J. Sare, Parkside, both of Australia, assignors to E.F. Seeley Nominees Pty. Ltd., Australia
Filed Nov. 8, 1988, Ser. No. 268,993
Claims priority, application Australia, May 9, 1988, 1487/88
Term of patent 14 years
U.S. Cl. D23—351

311,576
AIRBRUSH SPRAY BOOTH
Simon J. Everingham, Harrogate, England, assignor to Simair Graphics Equipments Limited, Leeds, England
Filed Dec. 30, 1987, Ser. No. 139,371
Claims priority, application United Kingdom, Jun. 30, 1987, 1043146
Term of patent 14 years
U.S. Cl. D23—371

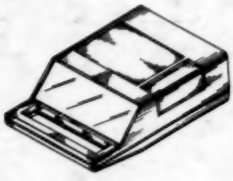


311,577
DUCT ACCESS AND SENSOR SUPPORT DOOR
H. Glenn Logsdon, Clearwater, Fla., assignor to Metal Industries, Inc., Clearwater, Fla.
Filed May 6, 1988, Ser. No. 191,600
Term of patent 14 years
U.S. Cl. D23—393

311,578
ARTIFICIAL FIREPLACE LOG
John E. MacIsaac, Beloit, Ohio, assignor to Sebring Forest Industries, Inc., Sebring, Ohio
Filed Jul. 1, 1988, Ser. No. 214,653
Term of patent 14 years
U.S. Cl. D23—409

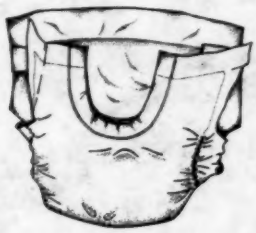
311,579
ORTHODONTIC APPLIANCE
John A. Collins, Jr., 1116 Mishawaka Ave., South Bend, Ind. 46615
Filed Jan. 4, 1988, Ser. No. 140,436
Term of patent 14 years
U.S. Cl. D24—10

311,580
CARDIAC PACEMAKER
Daniel E. Butler, and Neil G. McIlvaine, both of Seattle, Wash., assignors to Physio-Control Corporation, Redmond, Wash.
Filed Jun. 24, 1988, Ser. No. 211,414
Term of patent 14 years
U.S. Cl. D24—17



311,581
NURSING BOTTLE
Larry D. Mosley, 3722 49th Ave. Ct. NE., Tacoma, Wash. 98422
Filed Sep. 29, 1988, Ser. No. 250,958
Term of patent 14 years
U.S. Cl. D24—47

311,582
DIAPER FOR BABIES WITH AN UMBILICAL CORD REMNANT
Evelyn S. Gilchrist, 2301 Bunker Hill Cir., Plano, Tex. 75075
Filed Nov. 23, 1987, Ser. No. 124,457
Term of patent 14 years
U.S. Cl. D24—50

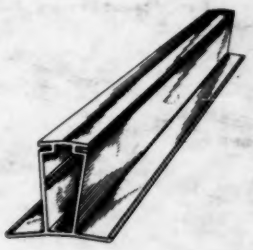


311,583
EXTRUSION
Irving W. Shell, Pompano Beach, Fla., assignor to Friedkin Industries, Inc., Boca Raton, Fla.
Filed Feb. 24, 1988, Ser. No. 160,076
Term of patent 14 years
U.S. Cl. D25—119

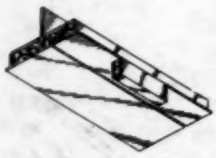
311,584
WINDOW COMPONENT EXTRUSION
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Sep. 12, 1989, Ser. No. 406,111
Term of patent 14 years
U.S. Cl. D25—122

311,585
WINDOW COMPONENT EXTRUSION
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Sep. 12, 1989, Ser. No. 406,083
The portion of the term of this patent subsequent to Oct. 23, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—122

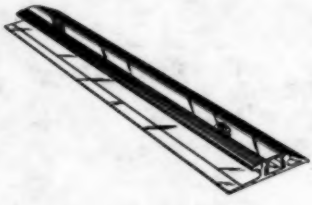
311,586
WINDOW COMPONENT EXTRUSION
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Sep. 12, 1989, Ser. No. 406,082
The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—122



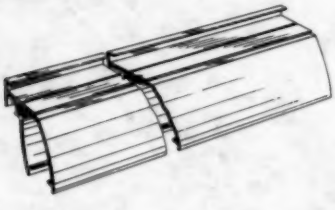
311,587
EXTRUDED MASTER FRAME WINDOW SILL
Leon F. Slocomb, Jr., 2641 W. Robino Dr., Wilmington, Del. 19808
Filed Aug. 18, 1989, Ser. No. 395,565
Term of patent 14 years
U.S. Cl. D25—124



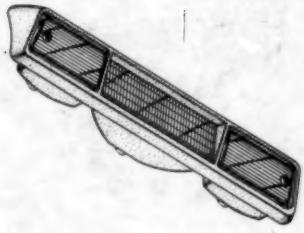
311,588
ISLE LIGHTING ASSEMBLY
Tom Nagano, Cerritos, Calif., assignor to Tivoli Industries, Inc., Santa Ana, Calif.
Filed May 23, 1988, Ser. No. 197,809
Term of patent 14 years
U.S. Cl. D26—24



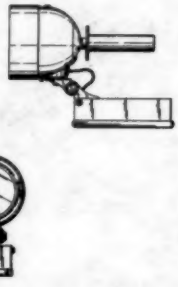
311,589
SHOWCASE LIGHT FIXTURE
Joseph Benchimol, 26 Cocksfield Ave., Downsview, Ontario, Canada, and Werner E. Dahnz, 28 Kimbermount Dr., Agincourt, Ontario, Canada M4J 4J2
Filed Sep. 4, 1987, Ser. No. 93,513
Claims priority, application Canada, Mar. 23, 1987, 23-03-87-8
Term of patent 14 years
U.S. Cl. D26—24



311,590
COMBINATION AUXILIARY BRAKE LIGHT AND CARGO LAMP FOR VEHICLES
Bradley C. VanRiper, Kennedy, and Marlin Ong, Lakewood, both of N.Y., assignors to Truck-Lite Co., Inc., Falconer, N.Y.
Filed Jul. 21, 1988, Ser. No. 222,227
Term of patent 14 years
U.S. Cl. D26—35

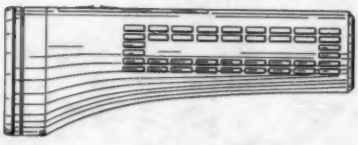


311,591
COMBINED BATTERY AND FLASHLIGHT
Jack D. Jones, and Carl A. Lewis, both of Lima, Ohio, assignors to Aircraft Dynamics Corporation, Elida, Ohio
Filed Jul. 25, 1988, Ser. No. 223,760
Term of patent 14 years
U.S. Cl. D26—44



311,592
ELECTRIC LANTERN
Gary B. Jones, Aurora, Colo., assignor to Havis-Shields Equipment Corporation, Warminster, Pa.
Filed Oct. 23, 1987, Ser. No. 111,970
Term of patent 14 years
U.S. Cl. D26—44

311,593
FLASHLIGHT
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Northbrook, Ill.
Filed Jun. 29, 1987, Ser. No. 67,473
Term of patent 14 years
U.S. Cl. D26—46

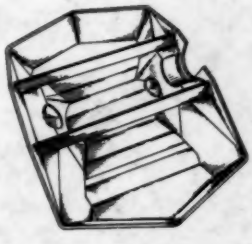


311,594
FLASHLIGHT
Christopher J. Medina, 2442 S. Raleigh St., Denver, Colo. 80219
Filed Nov. 9, 1987, Ser. No. 118,644
Term of patent 14 years
U.S. Cl. D26—47

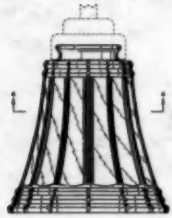
311,595
DENTAL FLOSSER
Howard H. Ewald, 2300 E. Patrict La., No. 15, Las Vegas, Nev. 89119
Filed Nov. 7, 1988, Ser. No. 269,104
Term of patent 14 years
U.S. Cl. D28—64

311,596
WALL MOUNTED LENSED INDIRECT LUMINAIRE
Douglas J. Herst, Berkeley, and Utkan Salman, Oakland, both of Calif., assignors to Peerless Lighting Corporation, Berkeley, Calif.
Filed Oct. 20, 1988, Ser. No. 260,359
Term of patent 14 years
U.S. Cl. D26—85

311,597
REFLECTOR FOR LAMPS
Jack Poot, Schipluiden, Netherlands, assignor to Poot Lichtenergie B.V., Schipluiden, Netherlands
Filed Aug. 14, 1987, Ser. No. 85,333
Term of patent 14 years
U.S. Cl. D26—118



311,598
GLASS LAMP SHADE
Fran M. Dordick, Lyndhurst, and David H. Porter, Chagrin Falls, both of Ohio, assignors to L. D. Kichler Co., Cleveland, Ohio
Filed Jun. 12, 1989, Ser. No. 365,037
Term of patent 14 years
U.S. Cl. D26—133



311,599
CIGARETTE LIGHTER CARRYING CASE
Michael P. Braden, 3212 Collier, San Diego, Calif. 92116
Filed Aug. 10, 1987, Ser. No. 83,730
Term of patent 14 years
U.S. Cl. D27—172

311,600
CIGARETTE CLIP
Larry J. Peracca, 924 Frazier Ave., Santa Rosa, Calif. 95405
Filed Mar. 7, 1988, Ser. No. 164,622
Term of patent 14 years
U.S. Cl. D27—183

311,601
HAIR SPRAY SHIELD
Karen A. Olivier, and Mark T. Olivier, both of 3337 Dobbin, Sterling Hts., Mich. 48310
Filed Jun. 6, 1988, Ser. No. 202,424
Term of patent 14 years
U.S. Cl. D28—9

311,602
COMB
Anthony Battaglia, 294 Atlantic Isle, Miami Beach, Fla. 33160
Filed May 20, 1988, Ser. No. 196,273
Term of patent 14 years
U.S. Cl. D28—30

311,603
HAIR COMB
Brian J. Drumm, Edinburgh, Scotland, assignor to Brian Drumm Flattopper Limited, Scotland
Filed Apr. 27, 1988, Ser. No. 186,631
Claims priority, application United Kingdom, Dec. 10, 1987, 1046986
Term of patent 14 years
U.S. Cl. D28—31

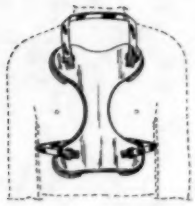
311,604
LIPSTICK CASES
Karena Bakic, Varese, Italy, assignor to Cosmede Anstalt, Vaduz, Liechtenstein
Filed Oct. 6, 1987, Ser. No. 105,213
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1987, URA 536/87
Term of patent 14 years
U.S. Cl. D28—85

311,605
BACK SCRATCHER
Gene Clayton, 29 W. Walling, St. Louis, Mo. 63141
Filed Oct. 3, 1988, Ser. No. 251,827
Term of patent 14 years
U.S. Cl. D28—99

311,606
ANGLED FIRE PROTECTION PORT
Ricky L. Henry, 39 Settlers Ct., Marietta, Ga. 30068
Filed Feb. 24, 1987, Ser. No. 18,070
Term of patent 14 years
U.S. Cl. D29—5

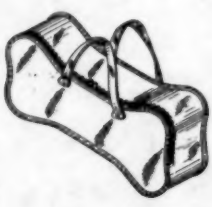
311,607
MOUTH TO MOUTH RESUSCITATOR
Thomas H. Howells, London, England, assignor to Vitalograph, Inc., Lenexa, Kans.
Filed May 16, 1988, Ser. No. 194,713
Term of patent 14 years
U.S. Cl. D29—7

311,608
STERNAL INCISION PROTECTOR
Bridget M. Harding, 1907 Efland Dr., Guilford County, N.C.
Filed Feb. 29, 1988, Ser. No. 162,413
Term of patent 14 years
U.S. Cl. D29—10



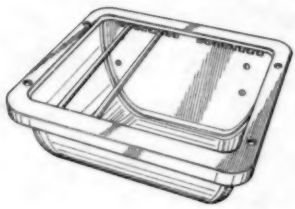
311,609
EAR PROTECTOR FOR OXYGEN FEED LINE
Edwin R. Stoneburner, Sr., 2414 N. 7th, St. Joseph, Mo. 64505
Filed Oct. 28, 1987, Ser. No. 113,719
Term of patent 14 years
U.S. Cl. D29—19

311,610
PET CARRYING CASE
Howard Dobelle, New City, N.Y., assignor to Andoe Inc., New City, N.Y.
Filed Mar. 4, 1988, Ser. No. 164,316
The portion of the term of this patent subsequent to Sep. 11, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D30—109

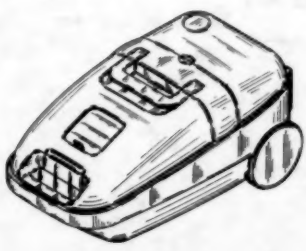


311,611
MANGER
Lucien Letarte, and Denis Malo, both of Joliette, Canada, assignors to Les Mangeoires Hygieniques L.-M. Inc., Joliette, Canada
Filed Sep. 24, 1986, Ser. No. 911,301
Term of patent 14 years
U.S. Cl. D30—131

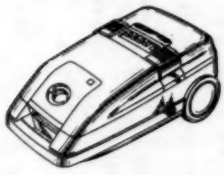
311,612
FOAL FEEDER
John M. Fuller, Winchester, Va., assignor to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Oct. 11, 1989, Ser. No. 419,638
Term of patent 14 years
U.S. Cl. D20—131



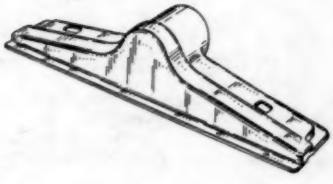
311,613
VACUUM CLEANER
Chikashi Kuriya, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Mar. 20, 1989, Ser. No. 325,499
Term of patent 14 years
U.S. Cl. D32—21



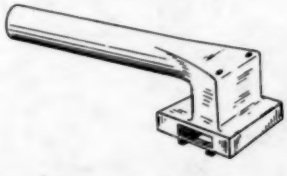
311,614
ELECTRIC VACUUM CLEANER
Yukio Hirano; Kunio Funatsu, both of Osaka; Joseph J. Nukazawa, Tokyo; Tadakazu Narikawa, Kanagawa, and Junichi Yamada, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Feb. 4, 1988, Ser. No. 152,604
Claims priority, application Japan, Aug. 11, 1987, 62-32851
Term of patent 14 years
U.S. Cl. D32—21



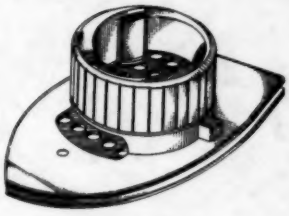
311,615
VACUUM CLEANER NOZZLE
Robert C. Berfield, Jersey Shore, and Ronald F. Meland, Muncy, both of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.
Filed Jan. 20, 1987, Ser. No. 5,430
Term of patent 14 years
U.S. Cl. D32—32

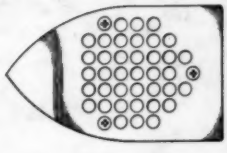


311,616
VACUUM CLEANER HOSE ATTACHMENT
Rick E. Hunts, 885 Barsby, Vista, Calif. 92083
Filed Aug. 28, 1987, Ser. No. 90,594
Term of patent 14 years
U.S. Cl. D32—32

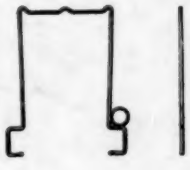


311,617
IRONING ACCESSORY FOR ATTACHMENT TO A HAIR BLOW DRYER
Paul Diamond, 23434 Sagebrush Way, Newhall, Calif. 91321
Filed Dec. 28, 1987, Ser. No. 139,691
Term of patent 14 years
U.S. Cl. D32—68

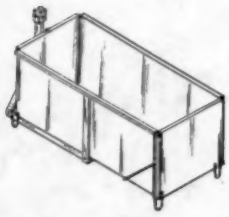




311,618
STAND FOR ELECTRIC PRESSING IRON COMBINED WITH CORD RETAINER
Henry Mattesky, Cedar Grove, N.J., assignor to Magla Products, Irvington, N.J.
Filed Sep. 16, 1987, Ser. No. 97,083
Term of patent 14 years
U.S. Cl. D32—73

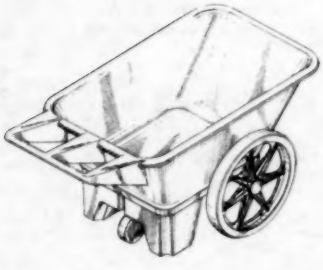


311,619
VEHICLE SUPPORTED DUMP CART
Mark V. Gravagna, Rte. 4, Box 167, DeSoto, Mo. 63020
Filed Jan. 1, 1987, Ser. No. 56,803
Term of patent 14 years
U.S. Cl. D34—3



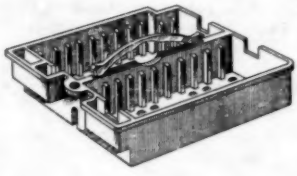
311,620
PROTECTIVE COVER FOR TRASH CONTAINERS OR THE LIKE
Edward L. Rose, 1008 S. 76th Ave., Yakima, Wash. 98908
Filed Jan. 8, 1987, Ser. No. 1,547
Term of patent 14 years
U.S. Cl. D34—11

311,621
STABLE CART
John M. Fuller, Winchester, Va., assignor to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Dec. 1, 1988, Ser. No. 278,433
Term of patent 14 years
U.S. Cl. D34—18

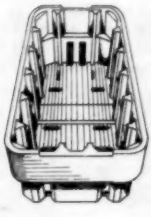


311,622
TOOL CADDY
Julian Swig, Oakland, Calif., assignor to Kaddies, Inc., Walnut Creek, Calif.
Filed May 23, 1988, Ser. No. 197,802
Term of patent 14 years
U.S. Cl. D34—25

311,623
CASSETTE TRAY
James W. Thompson, 28 Jennifer Ct., Mandeville, La. 70448
Filed Sep. 29, 1988, Ser. No. 237,553
Term of patent 14 years
U.S. Cl. D34—40



311,624
CONTAINER
David C. O'Leary, Beaver, Pa., and Theodore W. Perna, Jr., Leesburg, Va., assignors to Tuscarora Plastics, Inc., New Brighton, Pa.
Filed Apr. 21, 1988, Ser. No. 184,167
Term of patent 14 years
U.S. Cl. D34—40



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF OCTOBER, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
Niskanen, Toivo; and Reponen, Voitto, 4,964,950, Cl. 162-100.000.

A. Gusmer Inc.: *See*—
Austin, F. Jon; and Kubose, Don A., 4,965,084, Cl. 426-422.000.

A.O. Smith Corporation: *See*—
Threatt, Gary S., 4,964,394, Cl. 126-361.000.

AAI Corporation: *See*—
Hebert, John R., 4,964,341, Cl. 102-501.000.

AB Hassle: *See*—
Brandstrom, Arne E.; Lindberg, Per L.; Starke, Carl I.; and Sunden, Gunnel E., 4,965,269, Cl. 514-253.000.

Abe, Hidetoshi: *See*—
Ogata, Masatsugu; Segawa, Tadanori; Abe, Hidetoshi; Suzuki, Shigeo; and Kawata, Tatsuo, 4,965,657, Cl. 357-72.000.

Abe, Ryutaro; Takeuchi, Yoshiyuki; and Shibata, Kouichi, to Toyoda Koki Kabushiki Kaisha. Reservoir. 4,964,983, Cl. 210-168.000.

Abe, Toshio; Takahashi, Seiichi; Kamihara, Masaharu; Saito, Hitoshi; Tanaka, Seizo; and Suzuki, Yasuyuki, to TDK Corporation. Piezoelectric buzzer. 4,965,483, Cl. 310-324.000.

Abraham, William W.; and Gentelia, John S. Ink-reinforced polyurethane films. 4,965,126, Cl. 428-343.000.

Abt, John; and Delwiche, James A., to Grass Valley Group, Inc., The. Adaptive rounder for video signals. 4,965,668, Cl. 358-160.000.

ACEC, Societe Anonyme: *See*—
Grassart, Francis, 4,965,757, Cl. 364-576.000.

Adamache, Ion I., to Canterra Energy Ltd. Recovery of elemental sulphur from products containing contaminated elemental sulphur by froth flotation. 4,964,981, Cl. 209-166.000.

Adams, Depy P. Protective ear bags for dogs. 4,964,264, Cl. 54-80.000.

Adams, John O.: *See*—
Price, Charles S.; and Adams, John O., 4,965,552, Cl. 340-566.000.

Adams, Nicholas S. Fishing line slip sinker with quick attachment-/detachment means. 4,964,236, Cl. 43-44.920.

Adams, William L.; and Chesnut, Gary R., to Nalco Chemical Company. Method of inhibiting corroaion. 4,964,468, Cl. 166-310.000.

Adamson, Hugh P., to Turbulence Prediction Systems. Method for producing a warning of the existence of low-level wind shear and aircraftborne system for performing same. 4,965,572, Cl. 340-968.000.

Adelson, Edward H.: *See*—
Girod, Bernd; and Adelson, Edward H., 4,965,442, Cl. 250-201.700.

Adir ET CIE: *See*—
Vincent, Michel; Remond, Georges; and Cudennec, Claude, 4,965,250, Cl. 514-18.000.

Advanced Cardiovascular Systems, Inc.: *See*—
Tremulis, William S., 4,964,409, Cl. 128-657.000.

Advanced Computerized Systems Medical, Ltd.: *See*—
Livny, Michael, 4,964,858, Cl. 604-385.100.

Advena, Donna J.: *See*—
Bly, Vincent T.; Terrill, Conrad W.; and Advena, Donna J., 4,965,447, Cl. 250-233.000.

Aebersold, Rene, to Polytype AG. Device for varnishing the inside hollow bodies. 4,964,361, Cl. 118-302.000.

Aerospatiale Societe Nationale Industrielle: *See*—
Farineau, Jacques, 4,964,599, Cl. 244-195.000.

Ag-Chem Equipment Co., Inc.: *See*—
Takata, Harry H., 4,964,575, Cl. 239-655.000.

Agarwala, Ashok K., to Eastman Kodak Company. Modified viscometer for employment in torque magnetometry. 4,965,518, Cl. 324-228.000.

Agee, John M.; and King, Francis C., to Agee, John M. Instrumentation for implanting prosthetic devices. 4,964,861, Cl. 606-87.000.

AGFA-Gevaert AG: *See*—
Schneider, Rudolf; Muller, Jurgen; and Voigtlander, Volkmar, 4,965,455, Cl. 250-484.100.

Agustsson, Sigurdur: *See*—
Bieltvedt, Arnor; Jeroudi, Louay; Andersson, Lena; and Agustsson, Sigurdur, 4,964,523, Cl. 220-1.00T.

Ahne, Hellmut; and Hammerschmidt, Albert, to Siemens Aktiengesellschaft. Method for manufacturing highly heat-resistant dielectrics. 4,965,134, Cl. 428-411.100.

Aisan Kogyo Kabushiki Kaisha: *See*—
Takagi, Kunio, 4,964,210, Cl. 29-596.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Yamagiwa, Masataka; and Yamada, Naoki, 4,965,878, Cl. 364-424.050.

Aizawa, Katsuo: *See*—
Karasawa, Michito; Uchimoto, Mari; Kawabe, Hirofumi; Otani, Takuzo; and Aizawa, Katsuo, 4,965,064, Cl. 424-9.000.

Akasaka, Takeshi; Ochi, Kumie; Onari, Kazuhiro; Katayama, Tsutomu; Furuta, Hitoshi; Nakae, Kazumi; and Fukuda, Satomi, to Fuji Oil Company Limited. Process for producing tofu-like food. 4,965,080, Cl. 426-104.000.

Akebona Research and Development Centre Ltd.: *See*—
Watanabe, Namio, 4,964,490, Cl. 188-73.440.

Akebono Brake Industry Co., Ltd.: *See*—
Watanabe, Namio, 4,964,490, Cl. 188-73.440.

Akeda, Yoshitaka: *See*—
Ebe, Kazuyoshi; Narita, Hiroaki; Taguchi, Katsuhisa; Akeda, Yoshitaka; and Saito, Takanori, 4,965,127, Cl. 428-343.000.

Akesaka, Toshio, to Kabushiki Kaisha Iseki Kaihatsu Koki. Crushing machine. 4,964,580, Cl. 241-252.000.

Akiyama, Atsushi: *See*—
Maruyama, Tsutomu; Fukawa, Kiyotake; Akiyama, Atsushi; and Kiyomura, Yoshihiro, 4,965,073, Cl. 430-292.000.

Akiyama, Eitetsu; and Suzuki, Katsuhiko, to Honda Motor Co., Ltd. Idling rotational speed control system for internal combustion engines after cranking. 4,964,386, Cl. 123-339.000.

Akiyama, Masahiro: *See*—
Horikawa, Hideaki; and Akiyama, Masahiro, 4,965,224, Cl. 437-132.000.

Akiyama, Nobuyuki: *See*—
Yamauchi, Toshihiko; and Akiyama, Nobuyuki, 4,965,454, Cl. 250-372.000.

Akiyama, Tohru; and Okano, Takashi, to Pioneer Video Corporation. Data reading device having servo controlled position reset. 4,965,781, Cl. 369-44.350.

Aktik, Metin, to Mitel Corporation. Optical sensor. 4,965,212, Cl. 437-4.000.

Albers, Jan H. M.: *See*—
Greidanus, Pieter J.; Feijen, Jan; Eenink, Marinus J. D.; Rieke, Johannes C.; Olijslager, Jan; and Albers, Jan H. M., 4,965,128, Cl. 428-398.000.

Albert, Stuart D.: *See*—
Skudera, William J., Jr.; and Albert, Stuart D., 4,965,581, Cl. 342-19.000.

Alcatel NA, Inc.: *See*—
Nelson, John C.; and Cornelison, Kenneth E., 4,964,691, Cl. 350-96.230.

Alcatel N.V.: *See*—
Martineau, Didier, 4,965,866, Cl. 333-164.000.

Alcraft, Inc.: *See*—
Sugarman, Louis; and Dressler, Max B., 4,964,519, Cl. 211-50.000.

Alexander, Thomas A.; Daher, Lawrence J.; Hancock, Clarence L.; and Peterson, Donald L., to Miles Inc. Granulating composition and method. 4,965,072, Cl. 424-458.000.

Alfatechnic AG: *See*—
Dubach, Werner F., 4,964,537, Cl. 222-83.000.

Alfred Teves GmbH: *See*—
Burgdorf, Jochen; Reinartz, Hans-Dieter; Steffes, Helmut; Von Hayn, Holger; Volz, Peter; Wupper, Hans; Buschmann, Gunther; Beck, Erhard; Dehio, Gottfried; Dinkel, Dieter; and Rausch, Juergen, 4,964,681, Cl. 303-116.000.

Algra, Johannes E.; and Brouwer, Gerrit, to U.S. Philips Corporation. Power-supply circuit having circuitry for switching from a battery charging mode to a battery trickle-charging mode. 4,965,506, Cl. 320-23.000.

Allegheny Ludlum Corporation: *See*—
Ames, S. Leslie; and Breznak, Jeffrey M., 4,964,922, Cl. 148-111.000.
Hill, James B., 4,964,926, Cl. 148-325.000.

Allen, James A.: *See*—
Lancaster, Gerald M.; Pham, Tu-Anh; and Allen, James A., 4,965,314, Cl. 525-60.000.

Allen, Simon; Gordon, Paul F.; and Morley, John O., to Imperial Chemical Industries PLC. Non-linear optical device. 4,965,020, Cl. 252-587.000.

Allied-Signal Inc.: *See*—
Ball, Larry K.; and Hines, Marshall U., 4,964,422, Cl. 137-512.100.
Ball, Larry K.; Hines, Marshall U.; and Miller, Terry L., 4,964,431, Cl. 137-1.000.
Baughman, Ray H.; Buff, Ernest D.; Eckhardt, Helmut; and Ruchs, Gerhard H., 4,964,251, Cl. 52-171.000.
Bishop, Robert J.; Fontecchio, Robert P.; and Zelenak, Daniel G., Jr., 4,964,654, Cl. 280-743.000.
Swan, Ellen L.; Basu, Rajat S.; and Rodgers, Joel E., 4,965,011, Cl. 252-171.000.

Allington, Robert W.; Curran, Jon L.; and Schmidt, Jerold B., to Isco, Inc. Pumping system. 4,964,533, Cl. 222-14.000.

Alloy Surfaces Company, Inc.: *See*—
Baldi, Alfonso L., 4,965,095, Cl. 427-142.000.

Almond, Gary R.; and Storey, David W., to Data General Corporation. Methods and apparatus for multiplexing sub-rate channels in a digital data communication system. 4,965,787, Cl. 370-58.100.

Alpert, Mayer, to M. A. Industries Ltd. Combined shower head and waterproof tape deck. 4,964,181, Cl. 4-597.000.

Alpha Industries, Inc.: *See*—
Hartmann, Richard, Jr.; and Nolan, John H., 4,964,325, Cl. 83-321.000.
Nolan, John H.; and Skvarce, Dennis, 4,964,327, Cl. 83-698.000.
Nolan, John H.; and Skvarce, Dennis, 4,964,328, Cl. 83-698.000.

Alps Electric Co., Ltd.: *See*—
Ishikawa, Takatoshi, 4,965,610, Cl. 346-1.100.

Alter, Wendy S.: *See*—
Schmidt, Deborah D.; Alter, Wendy S.; and Hamilton, William D., 4,964,453, Cl. 164-122.100.

Altmann, Dieter; Haupt, Eberhard; and Knuppel, Manfred, to I.G. Bauerhin GmbH. Heated seat. 4,964,674, Cl. 297-180.000.

Aluminum Pechiney: *See*—
Meyer, Jean-Luc, 4,964,455, Cl. 164-468.000.

Alzner, Bernard G.; and Csongor, Desider G. Novel plasticating extruder screw. 4,964,730, Cl. 366-81.000.

Ambassador Industries: *See*—
Wyatt, James L., 4,964,191, Cl. 16-87.200.

American Air Liquide: *See*—
Wen, Horng-Yuan; Wang, Hwa-Chi; and Chesters, Stephen, 4,964,278, Cl. 62-55.500.

American Biomed, Inc.: *See*—
Summers, David P.; and Nixon, Jeddy D., 4,964,864, Cl. 623-3.000.

American Coastal Industries: *See*—
Bishop, Frank W., 4,964,349, Cl. 108-55.100.

American Cyanamid Company: *See*—
Nair, Vijay G.; Conrow, Ramson B.; Wang, Bosco S.; and Ruszala-Mallon, V. M., 4,965,284, Cl. 514-443.000.
Schiltz, John R.; and Nabial, Wanda, 4,965,450, Cl. 250-303.000.

Ames, S. Leslie; and Breznak, Jeffrey M., to Allegheny Ludlum Corporation. Method for domain refinement of oriented silicon steel by low pressure abrasion scribing. 4,964,922, Cl. 148-111.000.

Amikam, Zoran: *See*—
Jihad, Dakka; Amikam, Zoran; and Sasson, Yoel, 4,965,406, Cl. 562-414.000.

Amir, Israel, to AT&T Bell Laboratories. 3D imaging of a substrate using perpendicular scanning directions. 4,965,665, Cl. 358-101.000.

Amir, Michael: *See*—
Halevy, Eyal; and Amir, Michael, 4,964,331, Cl. 89-37.190.

Amoco Corporation: *See*—
Cliffton, Michael D.; and Carter, Stephen J., 4,965,384, Cl. 556-110.000.
Haddad, Muin S.; and Eryman, William S., 4,965,235, Cl. 502-209.000.
Harris, James E.; and Gavula, John P., 4,965,310, Cl. 524-406.000.
McCarthy, Terry B., 4,964,980, Cl. 208-340.000.
Smith, Michael P., 4,965,209, Cl. 436-32.000.
Wakley, William D.; Worrell, J. Robert; and Young, Grant A., 4,964,994, Cl. 210-512.100.

AMP Incorporated: *See*—
Gabany, Andrew J., 4,964,805, Cl. 439-63.000.
Giesbrecht, Wayne E.; Phillips, Howard C.; and Erb, David J., 4,964,200, Cl. 29-33.00M.
Hayes, Earl J., Sr.; Johnson, Daniel L.; and Martin, Galen M., 4,964,811, Cl. 439-398.000.
Jobson, Ian, 4,964,809, Cl. 439-357.000.
Kanai, Hirosumi, 4,964,817, Cl. 439-701.000.
Rowlette, John R., 4,964,698, Cl. 350-320.000.
Savitsky, Wallace R.; Schaffer, Ronald R.; and Warner, Gary N., 4,964,685, Cl. 350-96.200.

Amstutz, Hermann: *See*—
Holmes, Paul; Nevin, Alan; Amstutz, Hermann; and Nehring, Jurgen, 4,965,017, Cl. 252-299.400.

Anda Biologicals: *See*—
Maes, Roland F., 4,965,192, Cl. 435-7.000.

Anderson, Allen J. Wide-view horizontal vehicle safety mirror. 4,964,712, Cl. 350-618.000.

Anderson, Carl C.: *See*—
Kania, Charles M.; Anderson, Carl C.; and Sharma, Brij N., 4,965,317, Cl. 525-155.000.

Anderson, John; Homeyer, Bernhard; Kuhle, Engelbert; Scheinpflug, Hans; Zeck, Walter M.; and Simonet, Donald E., to Bayer Aktiengesellschaft; and Mobay Corporation. Agents for combating pests. 4,965,254, Cl. 514-89.000.

Anderson, John; Homeyer, Bernhard; and Zeck, Walter M., to Bayer Aktiengesellschaft; and Mobay Corporation. Carboximide containing agents for combating pests. 4,965,255, Cl. 514-128.000.

Anderson, John; Homeyer, Bernhard; and Zeck, Walter M., to Bayer Aktiengesellschaft; and Mobay Corporation. Flubenzimine containing agents for combating pests. 4,965,256, Cl. 514-128.000.

Anderson, Karen L.: *See*—
Pennebaker, William B.; Anderson, Karen L.; and Mitchell, Joan L. V., 4,965,677, Cl. 358-429.000.

Anderson, Robert E., to Cypress Semiconductor Corp. Programmable high speed state machine with sequencing capabilities. 4,965,472, Cl. 307-465.000.

Andersson, Bo, to Bahco Hydrauto AB. Valve for pressurized media. 4,964,611, Cl. 251-30.020.

Andersson, Lena: *See*—
Bieltvedt, Arnor; Jeroudi, Lousy; Andersson, Lena; and Agustsson, Sigurdur, 4,964,523, Cl. 220-1.00T.

Ando, Hitoshi: *See*—
Fukushima, Atsuhiko; Kashiwazaki, Takashi; Hosoi, Masayuki; and Ando, Hitoshi, 4,965,574, Cl. 340-995.000.

Andre, Eugene M.; Modzikowski, Allan G.; and Banks, Seth R., to Koss Corporation. Stereo headphone. 4,965,836, Cl. 381-183.000.

Andre, James R.; and Daniels, Larry. Ribbed pipe. 4,964,440, Cl. 138-122.000.

Andreas Stihl: *See*—
Siede, Reinhard; Hoppner, Klaus; Weiss, Hermann; and Weissert, Wolfgang, 4,964,217, Cl. 30-383.000.

Angele, Georg, to Borg Instruments GmbH. Device for the measurement of an event. 4,965,817, Cl. 377-19.000.

Angelucci, Francesco: *See*—
Caruso, Michele; Suarato, Antonino; Angelucci, Francesco; and Arcamone, Federico, 4,965,351, Cl. 536-6.400.

Anglin, Noah L.: *See*—
Cadwell, Peter F.; and Anglin, Noah L., 4,964,661, Cl. 292-87.000.

Anton/Bauer, Inc.: *See*—
Bauer, George W.; and Sokira, Thomas J., 4,965,738, Cl. 364-483.000.

Antosh, Mark J. Solar induction monorail fabrication apparatus. 4,964,793, Cl. 425-62.000.

Aoki, Hiroyuki: *See*—
Edo, Shouichi; and Aoki, Hiroyuki, 4,964,308, Cl. 73-862.360.

Aoki, Kazuhisa, to Matsushita Electric Works, Ltd. Electrical appliance with electrical hazard protection. 4,965,693, Cl. 361-42.000.

Aoki, Masakazu: *See*—
Etoh, Jun; Itoh, Kiyoo; Aoki, Masakazu; and Hori, Ryoichi, 4,965,769, Cl. 365-218.000.

Aoki, Shin'ya: *See*—
Suginoto, Masaru; Kohno, Osamu; Ikeno, Yoshimitsu; Sadakata, Nobuyuki; Nakagawa, Mikio; Aoki, Shin'ya; Tan, Masayuki; Okiai, Ryuichi; Yoshida, Syotaro; Hasegawa, Masakazu; and Yamanouchi, Hiroshi, 4,965,245, Cl. 505-1.000.

Aoki, Takayoshi: *See*—
Nagatsuka, Ikutaroh; Matsumura, Yasuo; Takeda, Masayuki; Suzuki, Chiaki; and Aoki, Takayoshi, 4,965,160, Cl. 430-108.000.

Aono, Fumio, to NEC Corporation. Memory access control system. 4,965,764, Cl. 364-900.000.

Aonuma, Shigeo; and Oyamada, Koichi, to Fuji Xerox Co., Ltd. Electrophotographic developer containing tin oxide. 4,965,162, Cl. 430-110.000.

Aoshima, Atsushi: *See*—
Ikeda, Masanori; Miura, Morikazu; and Aoshima, Atsushi, 4,965,379, Cl. 549-521.000.

Applied Biosystems, Inc.: *See*—
Woo, Sam L.; Menchen, Steven M.; and Fung, Steven, 4,965,349, Cl. 536-27.000.

Applied Theory, Division of U.S.N.R., Inc.: *See*—
Edwards, Paul O.; Bolton, William E.; Hunter, Larry C.; and Horner, Amos A., 4,965,734, Cl. 364-474.090.

APV UK Limited: *See*—
Soan, Basil, 4,965,508, Cl. 323-239.000.

Arai, Kenji: *See*—
Kurihara, Kazumasa; and Arai, Kenji, 4,965,730, Cl. 364-431.090.

Arai, Mikiro: *See*—
Funayama, Osamu; Arai, Mikiro; Nishii, Hayato; and Isoda, Takeshi, 4,965,058, Cl. 423-325.000.

Arai, Ryuichi; Haruta, Masahiro; Yamamoto, Nobuko; Yano, Tetsuya; Kishi, Hiroyoshi; and Sakuranaga, Masanori, to Canon Kabushiki Kaisha. Recording medium and process for forming color image with use of the same. 4,965,174, Cl. 430-340.000.

Arai, Shigeharu: *See*—
Funami, Fumiyasu; Kitsunezuka, Akira; Arai, Shigeharu; Sakuma, Nobuhiro; Okawara, Atsuo; and Sugiura, Tomiya, 4,965,297, Cl. 523-217.000.

Arai, Takao: *See*—
Tsuchida, Masami; Miyake, Ichiro; Takahashi, Tokihiro; Wakumura, Shinichi; Iso, Yoshimi; Arai, Takao; and Okamoto, Hiroo, 4,965,867, Cl. 341-118.000.

Arai, Tatsuo; and Saito, Takayoshi, to Mitsubishi Kinzoku Kabushiki Kaisha. Combination of cutter and fastner unit therefor. 4,964,762, Cl. 407-34.000.

Arakaki, Takeji: *See*—
Sugimoto, Yoshio; Muto, Ryujiro; and Arakaki, Takeji, 4,964,702, Cl. 350-339.00R.

Araki, Shinji: *See*—
Oohashi, Keiji; Suzuki, Hideo; Araki, Shinji; and Shimomichi, Tsuyoshi, 4,964,694, Cl. 350-96.330.

Arant, Odas E. Cold cathode light source for additive color enlarger. 4,965,624, Cl. 355-35.000.

Arao, Masaki; and Tsunemi, Shinichiro, to Omron Tateisi Electronics Co. Parts assembling apparatus. 4,964,211, Cl. 29-705.000.

Arbus Inc.: *See*—
Swanic, Anthony, 4,965,856, Cl. 455-617.000.

Arcamone, Federico: *See*—
Caruso, Michele; Suarato, Antonino; Angelucci, Francesco; and Arcamone, Federico, 4,965,351, Cl. 536-6.400.

Arco Chemical Technology, Inc.: *See*—
Younes, Usama E., 4,965,038, Cl. 264-552.000.

Arctic Fox Heaters: *See*—
Veach, Jack R.; and Helleksen, Alden C., 4,964,376, Cl. 123-557.000.

Arentsen, Dik, to IHC Holland N.V. Method for driving a hydraulic submerged tool. 4,964,473, Cl. 173-1.000.

Arikawa, Tomohiko: *See*—
Saki, Yosinori; Kotera, Hiroshi; Unemoto, Kazuo; Arikawa, Tomohiko; Jung, Wayne; Tutt, Timothy; and Dunk, Mike, 4,965,558, Cl. 340-712.000.

Arison, Byron H.: *See*—
Chen, Shieh-Shung J.; and Arison, Byron H., 4,965,200, Cl. 435-125.000.
Arita, Yoji, to Mitsubishi Kasei Corp. Magnetron sputtering apparatus. 4,964,968, Cl. 204-298.190.
Arizona Board of Regents, acting on behalf of Arizona State University: *See*—
Vandenberg, Edwin J.; and Mullis, Jeffrey C., 4,965,342, Cl. 528-417.000.
Armell, Richard A.; and Coull, David, to Eljay Well Services Limited. Shut-in tool. 4,964,460, Cl. 166-113.000.
Armer, Thomas A.: *See*—
Chang, Kin-Shiung; Armer, Thomas A.; and Bridges, William G., 4,965,227, Cl. 437-207.000.
Arminjon, Francois: *See*—
Quentin-Millet, Marie-Jose B.; Arminjon, Francois; and Donikian, Roupen R., 4,965,205, Cl. 435-252.000.
Arms, Steven W., to Micro Strain Company. Method of and means for measuring ligament tension. 4,964,862, Cl. 606-102.000.
Arnold, David; and Kowalczyk, Karen B., to General Electric Company. Molded case circuit breaker line strap configuration. 4,965,418, Cl. 200-144.00R.
Arnold, David: *See*—
Kelaita, Joseph B., Jr.; Arnold, David; and Smith, James I., 4,965,544, Cl. 335-202.000.
Arnold, G.: *See*—
Helmling, Oswald; Arnold, G.; Rzehak, H.; Fahey, George C., Jr.; Berger, Larry L.; Merchen, Neal R.; Medina, John; and Moerck, Rudi, 4,965,086, Cl. 426-636.000.
Arnoth, Frank W., to Du Pont de Nemours, E. I., and Company. Emergency respiration apparatus. 4,964,405, Cl. 128-205.170.
Asahi Fiber Glass Company Limited: *See*—
Funami, Fumiyasu; Kitsunezuka, Akira; Arai, Shigeharu; Sakuma, Nobuhiro; Okawara, Atsuo; and Sugiura, Tomiya, 4,965,297, Cl. 523-217.000.
Asahi Glass Company, Ltd.: *See*—
Sugimoto, Yoshio; Muto, Ryujiro; and Arakaki, Takeji, 4,964,702, Cl. 350-339.00R.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Hiraishi, Shigetoshi; and Kabashima, Kazuo, 4,965,237, Cl. 503-209.000.
Ikeda, Masanori; Miura, Morikazu; and Aoshima, Atsushi, 4,965,379, Cl. 549-521.000.
Kouji, Hiroyuki; and Misumi, Teruyuki, 4,964,905, Cl. 71-95.000.
Shimamura, Yasuki; and Ihata, Jyoji, 4,965,322, Cl. 525-332.600.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Suzuki, Minoru; Minefuji, Nobutaka; and Fujimoto, Osamu, 4,964,696, Cl. 350-315.000.
Asakura, Koichi: *See*—
Katoh, Eiichi; Asakura, Koichi; Hasegawa, Yutaka; and Bando, Toshiro, 4,965,637, Cl. 355-246.000.
Asami, Katsuhiko: *See*—
Hashimoto, Koji; Kumagai, Naokazu; Asami, Katsuhiko; and Kawashima, Asahi, 4,964,967, Cl. 204-292.000.
Asano, Atsushi: *See*—
Takayama, Mitsunao; Nakazawa, Takeshi; Yamauchi, Kozo; and Asano, Atsushi, 4,964,841, Cl. 474-11.000.
Asano, Yuji: *See*—
Sangyoji, Kazuo; Yamamoto, Takemi; Hatta, Naoyuki; Sakakibara, Kenji; Asano, Yuji; Hara, Yoshimasa; Matsumoto, Yumio; and Hayakawa, Kiyoharu, 4,965,592, Cl. 346-110.00R.
Asbeck, Adolf: *See*—
Schmid, Karl-Heinz; Meffert, Alfred; Schenker, Gilbert; Asbeck, Adolf; and Geke, Juergen, 4,965,019, Cl. 252-321.000.
Ashby, Carol I. H.; Hadley, G. Ronald; Hohimer, John P.; and Owyoung, Adelbert, to United States of America, Energy. Semiconductor laser devices having lateral refractive index tailoring. 4,965,806, Cl. 372-45.000.
Ashihara, Hideyuki. Police baton with rotatable crosshandle. 4,964,636, Cl. 273-84.00R.
Ashihara, Ryohei; Suehiro, Kikumitsu; Yabuta, Masayuki; and Yamagishi, Hideaki, to Matsushita Electric Industrial Co., Ltd. Metal jacket and dry cell using the same. 4,965,149, Cl. 429-168.000.
Ashiura, Yasuyuki: *See*—
Kawahara, Haruyuki; Tanaka, Katsumi; Ashiura, Yasuyuki; and Yoshimura, Motonobu, 4,964,801, Cl. 433-173.000.
Aslam, Mohammad: *See*—
Vicari, Richard; Aslam, Mohammad; Ray, Wilson B.; Davenport, Kenneth G.; Dammel, Ralph; Lingnau, Juergen; and Doessel, Karl-Friedrich, 4,965,400, Cl. 560-130.000.
Asrar, Jawed, to Monsanto Company. Norbornene dicarboximide polymer. 4,965,330, Cl. 526-259.000.
Astle, Lynn: *See*—
Grahn, Allen R.; and Astle, Lynn, 4,964,302, Cl. 73-865.700.
Astrope, Myrle E.; and Bushman, Norman P. Method and apparatus using bituminous sandstone for pavement repair. 4,964,752, Cl. 404-92.000.
AT&T Bell Laboratories: *See*—
Amir, Israel, 4,965,665, Cl. 358-101.000.
Blitchington, Frank H.; Chandross, Edwin A.; and Shepherd, Lloyd, 4,965,208, Cl. 436-5.000.
Elko, Gary W.; Kubli, Robert A.; McAteer, Jeffrey P.; and West, James E., 4,965,775, Cl. 367-119.000.
Fratello, Vincent J.; Rabinovich, Eliezer M.; and Shmulovich, Joseph, 4,965,091, Cl. 427-64.000.
Fuchs, Harold E., 4,965,094, Cl. 427-125.000.
Petty, Norman W., 4,965,796, Cl. 370-112.000.
Atalla, Martin M.; and Hopkins, Webster D. Multilevel security apparatus and method with personal key. 4,965,568, Cl. 340-825.340.
Atlantic Richfield Company: *See*—
Lowther, Frank E.; and Bohon, William M., 4,965,052, Cl. 422-187.000.
Ng, Fred W.; DiSiena, James P.; and Bseisu, Amjad A., 4,965,774, Cl. 367-75.000.
Atochem North America, Inc.: *See*—
King, James P., 4,965,001, Cl. 252-30.000.
Atomic Energy of Canada Limited: *See*—
Kolpin, Hans J., 4,965,486, Cl. 313-270.000.
Atsugi Motor Parts Company, Limited: *See*—
Yamaura, Tamotsu; Yamaoka, Fumiyuki; and Sasaki, Mitsuo, 4,964,493, Cl. 188-322.150.
Attig, Thomas G.: *See*—
Budge, John R.; and Attig, Thomas G., 4,965,378, Cl. 549-508.000.
Attinger, Thomas: *See*—
Huttenberger, Michael; Kleineberg, Wolfgang; Schaal, Hans; Attinger, Thomas; and Dietz, Jurgen, 4,965,555, Cl. 340-624.000.
Auclair, Michel; and Prats, Christian, to Ceramiques Techniques Desmarquest. Assembly of a ceramic head on a metal rod for a hip prosthesis. 4,964,869, Cl. 623-23.000.
August, Paul. Twin-piston two-stroke engine. 4,964,379, Cl. 123-51.00B.
Aumercier, M. Laurent: *See*—
Prevot, M. Gerard; Aumercier, M. Laurent; and Simoncelli, M. Philippe, 4,964,660, Cl. 292-37.000.
Auracher, Franz; Ebberg, Alfred; Noll, Bernd; Meissner, Eckhard; and Rodler, Hermann-Johann, to Siemens Aktiegesellschaft. Method for synchronized polarization switching of an optical transmission signal of an optical transmission system having superheterodyne reception and an apparatus for the implementation of said method. 4,965,857, Cl. 455-618.000.
Aurich, Edward L.: *See*—
Sasnett, Michael W.; Paitich, Ronald; and Aurich, Edward L., 4,964,735, Cl. 374-32.000.
Austin, F. Jon; and Kubose, Don A., to A. Gusmer Inc. Method of reducing the iron content in beverages utilizing a particulate filtered with a polydentate ligand. 4,965,084, Cl. 426-422.000.
AutoBoat Corporation: *See*—
Tafoya, Craig, 4,964,821, Cl. 440-38.000.
Automated Coil Systems Limited: *See*—
Otty, Macolm, 4,964,291, Cl. 72-298.000.
Automotive Prototypes & Equipment: *See*—
Dillon, John A., 4,964,666, Cl. 296-24.100.
Automotive Systems Laboratory, Inc.: *See*—
Karlow, James P., 4,964,652, Cl. 280-731.000.
Auvert, Geoffroy; Georgel, Jean-Claude; and Guerin, Yves, to Etat Fracais. Laser microbeam machine for acting on thin film objects, in particular for chemically etching or depositing substance in the presence of a reactive gas. 4,964,940, Cl. 156-345.000.
Avesi, Glenn: *See*—
Barmatz, Martin B.; Aveni, Glenn; Putterman, Seth; and Rudnick, Joseph, 4,964,303, Cl. 73-505.000.
Avesta Nyby Powder AB: *See*—
Tornberg, Claes, 4,965,043, Cl. 419-8.000.
AVL AG: *See*—
Wolfbeis, Otto; Kroneis, Herbert; and Offenbacher, Helmut, 4,965,087, Cl. 427-2.000.
Avvid Engineering, Inc.: *See*—
McCarthy, Alfred F., 4,964,198, Cl. 24-458.000.
Aysta, James E.: *See*—
Knoll, Randall L.; Aysta, James E.; and Lewon, Wilhelm, 4,964,206, Cl. 29-424.000.
Azeura, Hiroki: *See*—
Haruna, Hideaki; and Azeura, Hiroki, 4,964,343, Cl. 104-166.000.
B. F. Goodrich Company, The: *See*—
Lautenschlaeger, Friedrich K. W.; Bumanlag, Reynaldo G.; and Box, James A., 4,965,117, Cl. 428-182.000.
B.T.A. Automatic Piloting Systems Ltd.: *See*—
Berejik, Zacharia; and Wallach, Allon, 4,964,598, Cl. 244-190.000.
Baba, Shiro, to Hitachi, Ltd. Semiconductor integrated circuit device having a wiring layout to avoid intersections between analog signal wiring layers and digital signal wiring layers. 4,965,577, Cl. 341-141.000.
Babcock & Wilcox Company, The: *See*—
Huston, John T., 4,965,040, Cl. 376-236.000.
Bacardit, Juan S., to Bendix Espana. Hydraulic pressure generator. 4,964,274, Cl. 60-588.000.
Bach, Gary, to Reynolds Consumer Products, Inc. Texturized cell material for confinement of concrete and earth materials. 4,965,097, Cl. 428-194.000.
Bachmann, Andrew G.; and Hillman, James M., to Dymax Corporation. Bonding method using photocurable acrylate adhesive containing perester/tautomeric acid adhesion promoter. 4,964,938, Cl. 156-273.700.
Bachmann, Othmar: *See*—
Oehy, Peter; Brennwalder, Daniel; and Bachmann, Othmar, 4,964,267, Cl. 57-22.000.
Bachmann, Rolf, to W. Gunther GmbH. Acceleration and deceleration sensor. 4,965,416, Cl. 200-61.45M.
BackStop, Inc.: *See*—
Miele, Joseph R., 4,964,485, Cl. 180-275.000.
Badiali, Roberto: *See*—
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Bae, Dong-Joo: *See*—
Choi, Kyu H.; Lee, Jung H.; Lee, Heyung-Sub; Yook, Tae-Yoon; and Bae, Dong-Joo, 4,965,214, Cl. 437-24.000.

Bae, Hae Kyung: *See*—
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Bagley, Bruce, to Mass Market Sales, Inc. Disposable food container for microwave ovens. 4,965,424, Cl. 219-10.55E.

Bagnall, Adam, to Rolls-Royce plc. Gearbox arrangement for driving coaxial contra rotating multi-bladed rotors. 4,964,844, Cl. 475-295.000.

Bagwell, Timothy L.: *See*—
Elliott, Scott S.; Bray, Robert C.; Bagwell, Timothy L.; and Cross, Peter S., 4,965,479, Cl. 310-313.00D.

Bahco Hydrauto AB: *See*—
Andersson, Bo, 4,964,611, Cl. 251-30.020.

Bailey, Bryan K.: *See*—
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Bailey, Stuart: *See*—
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Bair, Kenneth W., to Burroughs Wellcome Co. Dibenzothiphene and naphthalenethiophene derivatives. 4,965,285, Cl. 514-443.000.

Bair, Thomas I.; and Zafiroglu, Dimitri P., to Du Pont de Nemours, E. I., and Company. Article for absorbing liquids. 4,965,129, Cl. 428-398.000.

Baker, Don L.; Gilda, Glenn D.; Quinn, Terrence A.; and Shaukatullah, Hussain, to IBM. Removable thermocouple template for monitoring temperature of multichip modules. 4,964,737, Cl. 374-179.000.

Baker Hughes Incorporated: *See*—
Davis, Steven S., 4,964,986, Cl. 210-231.000.
Mueller, Max A., 4,964,988, Cl. 210-401.000.

Baker, Roger L.: *See*—
Scovell, Peter D.; Blomley, Peter F.; and Baker, Roger L., 4,965,216, Cl. 437-31.000.

Baker, Ross G., Jr.; and Vandegriff, Joseph W., to Intermedics, Inc. Method and apparatus for assuring pacer programming is compatible with the lead. 4,964,407, Cl. 128-419.0PG.

Baker, Russ J.; Hansen, Robert A.; Scott, Paul F.; and Vozenilek, Edward F., to Emhart Industries, Inc. Glass container inspection machine with rejection parameter selector. 4,965,523, Cl. 324-672.000.

Balakrishnan, Ramesh, to Measurex Corporation. Cross-directional control of sheetmaking systems. 4,965,736, Cl. 364-469.000.

Balazek, David T.: *See*—
Kolvites, Albert; Cohn, Robert J.; Welsch, John H.; Sickles, Willard J.; and Balazek, David T., 4,964,350, Cl. 108-110.000.

Baldi, Alfonso L., to Alloy Surfaces Company, Inc. Method for refurbishing used jet engine hot section airfoils. 4,965,095, Cl. 427-142.000.

Baldwin, William C. Diaphragm latch mechanism. 4,964,659, Cl. 292-19.000.

Balkin, Larry M. Locking garment hanger. 4,964,550, Cl. 223-91.000.

Ball, Larry K.; and Hines, Marshall U., to Allied-Signal Inc. Butterfly-type check valve. 4,964,422, Cl. 137-512.100.

Ball, Larry K.; Hines, Marshall U.; and Miller, Terry L., to Allied-Signal Inc. Butterfly valve apparatus and method. 4,964,431, Cl. 137-1.000.

Ball, Robert C.; and German, Paul G., to Versa Medical Technologies, Inc. Milding teat cup having extended liner shell seal. 4,964,368, Cl. 119-14.490.

Ballard Medical Products: *See*—
Jessop, Paul M., 4,965,050, Cl. 422-100.000.

Ballestrazzi, Aris; and Tassi, Lamberto, to Sitma, S.p.A. Packaging machine equipped with an improved welding and cutting device. 4,964,263, Cl. 53-555.000.

Balsells, Joan C.: *See*—
Balsells, Peter J., 4,964,204, Cl. 29-173.000.

Balsells, Peter J., to Balsells, Peter J.; and Balsells, Joan C. Method for making a garter-type axially-resilient coil spring. 4,964,204, Cl. 29-173.000.

Balsley, Joseph W. Key cache. 4,964,508, Cl. 206-37.100.

Baltimore Aircoil Company: *See*—
Osborne, William T., 4,964,279, Cl. 62-59.000.

Balzan, Matthew L.: *See*—
Geisberger, Arthur E.; Sadler, Robert A.; Luper, Paulette; and Balzan, Matthew L., 4,965,218, Cl. 437-41.000.

Bandai America Incorporated: *See*—
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Bando, Toshiro, to Ricoh Company, Ltd. Image recording apparatus capable of controlling image density. 4,965,634, Cl. 355-208.000.

Bando, Toshiro: *See*—
Katoh, Eiichi; Asakura, Koichi; Hasegawa, Yutaka; and Bando, Toshiro, 4,965,637, Cl. 355-246.000.

Baney, Ronald H.; Bilgrien, Carl J.; Fiedler, Lawrence D.; and Lee, Chi-long, to Dow Corning Corporation. Process for preparation of silacyclobutanes. 4,965,367, Cl. 548-110.000.

Banks, Seth R.: *See*—
Andre, Eugene M.; Modzikowski, Allan G.; and Banks, Seth R., 4,965,836, Cl. 381-183.000.

Bankstahl, Herbert A.: *See*—
Newman, Neil A.; Bankstahl, Herbert A.; Griffiths, John M.; Forsgren, Lyle M.; and Beck, Wayne T., 4,964,823, Cl. 440-61.000.

Banner Engineering Corp.: *See*—
Fayfield, Robert W., 4,965,548, Cl. 340-511.000.

Bantjes, Adriaan: *See*—
Brinkman, Egbert; and Bantjes, Adriaan, 4,965,112, Cl. 428-36.910.

Bar-Master International: *See*—
Smith, Dell W., 4,964,542, Cl. 222-146.600.

Barabash, William; and Yerazunis, William S., to Digital Equipment Corporation. Method for operating a parallel processing system and related apparatus. 4,965,882, Cl. 364-513.000.

Baran, John S.; Lindberg, Thomas J.; and Lowrie, Harman S., to G. D. Searle & Co. Substituted glutaric acid lactones in the treatment of hyperlipidemia. 4,965,373, Cl. 549-273.000.

Baran, Richard J.: *See*—
Coffey, Donald T.; Oltz, Charles H.; Roth, Donald D.; and Baran, Richard J., 4,964,525, Cl. 220-3.900.

Bare, Rex O.: *See*—
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Barham, Steven T.; and Hurst, Michael J., to Unisys Corp. Apparatus for estimating distortion resulting from compressing digital data. 4,965,830, Cl. 381-31.000.

Barmatz, Martin B.; Avesi, Glenn; Putterman, Seth; and Rudnick, Joseph, to United States of America, National Aeronautics and Space Administration. Acoustic positioning and orientation prediction. 4,964,303, Cl. 73-505.000.

Barna, Tamas: *See*—
Foldi, Tivadar; Biro, Gabor; Barna, Tamas; Nagy, Imre; and Vincze, Laszlo , 4,965,876, Cl. 362-247.000.

Barnard, Michael E., to U.S. Philips Corp. Radio receiver circuit with timing feedback control for a tunable bandpass filter. 4,965,853, Cl. 455-209.000.

Barnett, Gary: *See*—
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Barnhurst, Robert J., to Noranda Inc. Creep resistant zinc-aluminum based casting alloy. 4,965,046, Cl. 420-519.000.

Barr & Stroud Limited: *See*—
Ritchie, David S., 4,964,724, Cl. 356-152.000.

Bartch, Donald W.: *See*—
Deal, Samuel B.; and Bartch, Donald W., 4,965,096, Cl. 427-165.000.

Bartlett, Robert R.; Schleyerbach, Rudolf; and Kammerer, Friedrich-Johannes, to Hoechst Aktiengesellschaft. Medicaments to combat chronic graft-versus-host diseases. 4,965,276, Cl. 514-378.000.

Barton, Roger E. C.; Van Breen, Adriaan W.; and Klei, Ebel, to Shell Oil Company. Containers for liquid hydrocarbons. 4,965,104, Cl. 428-34.100.

Barton, Thomas J.; and Ijadi-Maghsoodi, Sina, to Iowa State University Research Foundation, Inc. Silyl- and disilanyl-1,3-butadiyne polymers from hexachloro-1,3-butadiene. 4,965,332, Cl. 528-25.000.

BASF Aktiengesellschaft: *See*—
Baur, Richard; Stoeckigt, Dieter; Neumann, Hans-Werner; Goertz, Hans-Helmut; and Wagner, Norbert, 4,965,009, Cl. 252-142.000.
Dehnert, Johannes; Lamm, Gunther; and Loeffler, Hermann, 4,965,346, Cl. 534-766.000.
Hoffrichter, Bernd; Pavelka, Bozidar; Pfefferkorn, Dietmar; Schaeffer, Norbert; and Goetz, Klaus, 4,964,588, Cl. 242-199.000.
Huellmann, Michael; Becker, Rainer; Lauterbach, Gerald; Buschmann, Ernst; Eckhardt, Heinz; Himmele, Walter; and Brueckner, Christiane, 4,965,376, Cl. 549-423.000.
Loeffler, Hermann, 4,965,345, Cl. 534-651.000.
Taubitz, Christof; Seiler, Erhard; Hambrecht, Juergen; Mitulla, Konrad; and Reimann, Horst, 4,965,318, Cl. 525-179.000.

Basham, Bryan D.: *See*—
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Basic Engineering Ltd.: *See*—
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Bastian, Thomas W.; and Schertz, Charles W., to General Dynamics Corp., Pomona Division. Multiple stage rocket propelled missile system. 4,964,339, Cl. 102-376.000.

Basu, Rajat S.: *See*—
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Baldorf, Vern H., to H. B. Fuller Company. Smoke suppressant compositions for halogen-containing plastics and methods of using. 4,965,309, Cl. 524-405.000.

Batteux, Pierre, to Gerin, Merin. Magnetic trip device with wide tripping threshold setting range. 4,965,543, Cl. 335-174.000.

Bauer, George W.; and Sokira, Thomas J., to Anton/Bauer, Inc. Intelligent battery system. 4,965,738, Cl. 364-483.000.

Baughman, Ray H.; Buff, Ernest D.; Eckhardt, Helmut; and Ruchs, Gerhard H., to Allied-Signal Inc. Dual-pane thermal window with liquid crystal shade. 4,964,251, Cl. 52-171.000.

Baumann, Joseph D. Permanent magnetic retaining device to move, affix or carry ferromagnetic parts or loads with electronic switching of the magnetic flux to release the carried load. 4,965,695, Cl. 361-142.000.

Baur, Richard; Stoeckigt, Dieter; Neumann, Hans-Werner; Goertz, Hans-Helmut; and Wagner, Norbert, to BASF Aktiengesellschaft. Aqueous acidic cleaner formulations. 4,965,009, Cl. 252-142.000.

Baxter, Dennis E.: *See*—
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Baxter International Inc.: *See*—
Christine, William C.; Lyons, Steffen; Posey, John; Schmidt, Josef; and Herschman, George J., 4,964,944, Cl. 156-515.000.
Prince, Paul R., 4,964,847, Cl. 604-4.000.
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Bayer Aktiengesellschaft: *See*—
Anderson, John; Homeyer, Bernhard; Kuhle, Engelbert; Scheinpflug, Hans; Zeck, Walter M.; and Simonet, Donald E., 4,965,254, Cl. 514-89.000.
Anderson, John; Homeyer, Bernhard; and Zeck, Walter M., 4,965,255, Cl. 514-128.000.
Anderson, John; Homeyer, Bernhard; and Zeck, Walter M., 4,965,256, Cl. 514-128.000.
Boshagen, Horst; Rosentreter, Ulrich; Lieb, Folker; Oediger, Hermann; Seuter, Friedel; Perzborn, Elisabeth; and Fiedler, Volker-Bernd, 4,965,258, Cl. 514-158.000.
Eichenauer, Herbert; Leitz, Edgar; and Ott, Karl-Heinz, 4,965,300, Cl. 525-415.000.
Heinemann, Ulrich; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,965,265, Cl. 514-250.000.
Hendricks, Udo W.; Sanders, Josef; and Tamer, Ergun, 4,964,875, Cl. 8-442.000.
Kruger, Bernd W.; Sasse, Klaus; Lunkenheimer, Winfried; Hoever, Franz P.; Nentwig, Gunther; and Behrenz, Wolfgang, 4,965,286, Cl. 514-514.000.
Muller, Hanns P.; Kapps, Manfred; Vehlewald, Peter; Meyer, Frank; Cornely, Wolfgang; and Mehesch, Hans E., 4,965,292, Cl. 521-110.000.
Reuter, Knud; Freitag, Dieter; Weymans, Gunther; Dhein, Rolf; Meier, Erich; and Muller, Gerold, 4,964,890, Cl. 55-158.000.
Schwabe, Peter; Schlak, Ottfried; Knispel, Gottfried; and Voigt, Reiner, 4,965,295, Cl. 523-109.000.
Stendel, Wilhelm; Neuhauser, Hubert; and Koeniger, Nikolaus, 4,965,287, Cl. 514-531.000.
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Wollweber, Detlef, 4,965,363, Cl. 548-561.000.
BBC Brown Boveri Ltd.: *See*—
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Beam, Don E.; Wills, David C.; and Forsythe, Donald L., to NCR Corporation. Overhead mount for a CRT. 4,964,606, Cl. 248-333.000.
Bean, Ross C.: *See*—
Zanio, Ken; and Bean, Ross C., 4,965,649, Cl. 357-30.000.
Beck, Donald R.; Sheiffo, Loren; and Ontawar, Susan P., to Repeat-O-Type Manufacturing Corporation. Transfer fluid for spirit duplicating systems. 4,964,910, Cl. 106-21.000.
Beck, Erhard: *See*—
Burgdorf, Jochen; Reinartz, Hans-Dieter; Steffes, Helmut; Von Hayn, Holger; Volz, Peter; Wupper, Hans; Buschmann, Gunther; Beck, Erhard; Dehio, Gottfried; Dinkel, Dieter; and Rausch, Juergen, 4,964,681, Cl. 303-116.000.
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Beck, Wayne T.: *See*—
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Becker, Kurt. Instrument for monitoring the cooling conditions in a light water reactor. 4,965,041, Cl. 376-258.000.
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Beckman Instruments, Inc.: *See*—
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Szwarc, Joseph M., 4,964,866, Cl. 604-192.000.
Bedi, Ram, to K. J. Manufacturing. Process for simple and high speed oil change and/or flushing the engine oil distribution channels of the moving components of the crankcase in an internal combustion engine. 4,964,373, Cl. 123-196.00R.
Beechan Group p.l.c.: *See*—
Harnden, Michael R.; Wyatt, Paul G.; and Bailey, Stuart, 4,965,270, Cl. 514-262.000.
Behnk, Holger: *See*—
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Kruger, Bernd W.; Sasse, Klaus; Lunkenheimer, Winfried; Hoever, Franz P.; Nentwig, Gunther; and Behrenz, Wolfgang, 4,965,286, Cl. 514-514.000.
Behringwerke Aktiengesellschaft: *See*—
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Kolar, Cenek; Paal, Michael; Hermentin, Peter; and Kraemer, Hans P., 4,965,352, Cl. 536-6.400.
Bell Communications Research, Inc.: *See*—
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Bell-Northern Research Ltd.: *See*—
Sparks, Thomas C., 4,965,811, Cl. 375-109.000.
Beloit Corporation: *See*—
Fredriksson, Borje; and Chamberlin, Jeffery L., 4,964,733, Cl. 366-336.000.
Gobel, Richard J., 4,964,226, Cl. 34-136.000.
Belter, Robert F., to R.F. Belter Corporation. Adhesive applying machine. 4,964,367, Cl. 118-667.000.
Bender, Martin P. Pulverizing mill control system. 4,964,578, Cl. 241-30.000.
Bendix Espana: *See*—
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Benford, Howard L.; Leising, Maurice B.; and Holbrook, Gerald L., to Chrysler Corporation. Pressure balanced pistons in an automatic transmission. 4,964,506, Cl. 192-106.00F.
Benford, Howard L.: *See*—
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Benn, James A. Bag filling method and apparatus for preparing pharmaceutical sterile solutions. 4,964,261, Cl. 53-469.000.
Bennett, Paul T.; Willard, David F.; Tahernia, Omid; Page, James C.; Spiro, Alan I.; and Lambrecht, Frank E., to Motorola, Inc. Digitized stored voice paging receiver. 4,965,569, Cl. 340-825.440.
Bennison, John J.; and Clifford, Richard P., to W. R. Grace & Co.-Conn. Method of controlling pitch using a cationically modified tannin. 4,964,952, Cl. 162-158.000.
Benson, James A.; and Benson, James M. Fishing signal device. 4,964,233, Cl. 43-17.000.
Benson, James M.: *See*—
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Kirilloff, Victor V.; Cummins, Robert; and Benson, William A., 4,964,346, Cl. 105-225.000.
Benz & Hilgers GmbH: *See*—
Mooshammer, Alfred, 4,964,545, Cl. 222-271.000.
Berejik, Zacharia; and Wallach, Allon, to B.T.A. Automatic Piloting Systems Ltd. Apparatus and method for controlling aircraft, particularly remotely-controlled aircraft. 4,964,598, Cl. 244-190.000.
Berg, Jon A.: *See*—
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Berger, Larry L.: *See*—
Helmling, Oswald; Arnold, G.; Rzehak, H.; Fahey, George C., Jr.; Berger, Larry L.; Merchen, Neal R.; Medina, John; and Moerck, Rudi, 4,965,086, Cl. 426-636.000.
Bergwerksverband GmbH: *See*—
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Berkowitz, Gerald. Adaptor handle with adjusting mechanism. 4,964,648, Cl. 280-304.500.
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Berry, John P., to Ethicon, Inc.; and University of Liverpool, The. Electrostatically produced structures and methods of manufacturing. 4,965,110, Cl. 428-36.400.
Berry, Kirk H.: *See*—
Mostafa, Asghar D.; and Berry, Kirk H., 4,965,798, Cl. 370-079.000.
Berry, William W.; and Rossiter, Gordon J., to Florida Recoveries Partnership. Process for removing fluoride from a wastewater and producing hydrofluoric acid therefrom. 4,965,061, Cl. 423-484.000.
Bertram, James L.; Walker, Louis L.; McCrary, Avis L.; and Cortez, Fermin M., to Dow Chemical Company, The. Substituted phenol-formaldehyde novolac resins containing reduced quantities of 2-functional components and epoxy novolac resins prepared therefrom. 4,965,324, Cl. 525-507.000.
Besic, Dragan; and Smith, Wilbur C., to Dresser Industries, Inc. Inherently flushing piston rod for a reciprocating pump. 4,965,042, Cl. 417-437.000.
Bethea, James R.; and Betso, Stephen R., to Dow Chemical Company, The. Extrudable polymeric compositions. 4,965,304, Cl. 524-123.000.
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Beyer, Diana: *See*—
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Beyer, Herbert O.; and Beyer, Diana. Extensible bottle draining shelf. 4,964,605, Cl. 248-311.300.
Bickoff, Charles. Modular puppet system. 4,964,832, Cl. 446-100.000.
Biel, Edward N.; and Tucker, Edward B., to First Brands Corporation. Low temperature impact and puncture resistant thermoplastic films and bags therefrom. 4,965,108, Cl. 428-35.700.
Biel, Edward N.: *See*—
Tucker, Edward B.; and Biel, Edward N., 4,965,109, Cl. 428-35.700.
Bjeltvedt, Arnor; Jeroudi, Louay; Andersson, Lena; and Agustsson, Sigurdur, to Johnson & Wales University. Partitioned trash receptacle with flat and arcuate sides. 4,964,523, Cl. 220-1.00T.
Bieri, Hans, to Hydrostress AG. Dual control valve suitable for high pressure fluids. 4,964,434, Cl. 137-567.000.
Biggs, Ian S.; and Radvan, Bronislaw, to Wiggins Teape Group Limited, The. Method of making fibre reinforced thermoplastics material structure. 4,964,935, Cl. 156-242.000.
Bilgrien, Carl J.: *See*—
Baney, Ronald H.; Bilgrien, Carl J.; Fiedler, Lawrence D.; and Lee, Chi-long, 4,965,367, Cl. 548-110.000.

Billand, Marcel: *See*—
Lenormand, Regis; Billand, Marcel; Fraise, Pierre; Goupil, Jean-Claude; Raguenet, Gerard; and Rene, Didier, 4,965,587, Cl. 342-372.000.

Billman, Elizabeth R.: *See*—
Mehrotra, Pankaj K.; and Billman, Elizabeth R., 4,965,231, Cl. 501-89.000.

Bilterijst, Jan A., to U.S. Philips Corporation. Sampling system, pulse generation circuit and sampling circuit suitable for use in a sampling system, and oscilloscope equipped with a sampling system. 4,965,467, Cl. 307-352.000.

Binz, Jorg: *See*—
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Biochimica OPOS SpA: *See*—
Ratti, Luigi; and Dall'Asta, Leone, 4,965,355, Cl. 540-226.000.

Biotest Pharma GmbH: *See*—
Stephan, Wolfgang; Dichtelmuller, Herbert; and Kloft, Michael, 4,965,068, Cl. 424-87.000.

Birk, Rolf: *See*—
Gais, Hans-Joachim; Erdelmeier, Irene; and Birk, Rolf, 4,964,846, Cl. 549-336.000.

Biro, Gabor: *See*—
Foldi, Tivadar; Biro, Gabor; Barna, Tamas; Nagy, Imre; and Vincze, Laszlo , 4,965,876, Cl. 362-247.000.

Bishop, Frank W., to American Coastal Industries. Load carrying platforms. 4,964,349, Cl. 108-55.100.

Bishop, Robert J.; Fontecchio, Robert P.; and Zelenak, Daniel G., Jr., to Allied-Signal Inc. Air bag assembly. 4,964,654, Cl. 280-743.000.

Bishop, Ronald D.; and Hoberg, Paul, to GTE Mobilnet Incorporated. Cellular mobile radiotelephone-based system for rental of mobile equipment. 4,965,821, Cl. 379-91.000.

Blackman, Calvin C. Method and apparatus for quickly purging atmosphere gas from bell furnace. 4,964,798, Cl. 432-23.000.

Blackstone Corporation: *See*—
Monteleone, John, 4,965,431, Cl. 219-123.000.

Blackwell, Steven R.; Polge, Steve; Windham, Danny; and Bruce, Melvin, to Motorola, Inc. Processor modem. 4,965,641, Cl. 375-7.000.

Blair, James F. L.: *See*—
Phillips, William C.; and Blair, James F. L., 4,965,420, Cl. 200-341.000.

Blake, Terence G. W., to Texas Instruments Incorporated. Silicon-on-insulator transistor with body node to source node connection. 4,965,213, Cl. 437-21.000.

Blakeslee, Bruce L.: *See*—
Von Brandt, Kim; Blakeslee, Bruce L.; Keil, John, Jr.; and Stroud, Robert D., 4,964,941, Cl. 156-360.000.

Blankenship, William P.; Ritter, Robert; and Schmitten, Phillip F., to Westinghouse Electric Corp. Plastic water box for a thermoelectric air conditioner. 4,964,277, Cl. 62-3.200.

Blitchington, Frank H.; Chandross, Edwin A.; and Shepherd, Lloyd, to AT&T Bell Laboratories. Inspection of multipattern circuit boards. 4,965,208, Cl. 436-5.000.

Blixt, Tony; and Hakansson, Philip, to W. R. Grace & Co.-Conn. Sizing composition, a method for the preparation thereof and a method of use. 4,964,915, Cl. 106-210.000.

Bloebaum, Roy D., to Harrington Arthritis Research Center. Knee prosthesis. 4,964,868, Cl. 623-20.000.

Blomley, Peter F.: *See*—
Scovell, Peter D.; Blomley, Peter F.; and Baker, Roger L., 4,965,216, Cl. 437-31.000.

Bloom, Philip M. Treatment of multiple sclerosis with lymphocytapheresis and chemo-immunosuppression. 4,964,848, Cl. 604-6.000.

Bloss, Karl H.: *See*—
Neuman, George A.; and Bloss, Karl H., 4,965,093, Cl. 427-109.000.

Blount, William W.: *See*—
Zoeller, Joseph R.; and Blount, William W., 4,965,399, Cl. 560-64.000.

Bly, Vincent T.; Terrill, Conrad W.; and Advena, Donna J., to United States of America, Army. Chopper for staring infrared systems. 4,965,447, Cl. 250-233.000.

Blythe, Rowland P., Jr.: *See*—
Silbering, Steven B.; Blythe, Rowland P., Jr.; Nesbitt, Russell U., Jr.; and Fawzi, Mahdi B., 4,965,203, Cl. 435-188.000.

Board of Governors of Wayne State University, The: *See*—
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Bobrick Washroom Equipment, Inc.: *See*—
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Bobrowski, Gregory S.; Guecia, Gregory C. J.; Lupyan, David A.; and Kinney, Frederick D., to Sandoz Ltd. Methods and compositions for reclaiming concrete. 4,964,917, Cl. 106-804.000.

BOC Group, Inc., The: *See*—
Young, Paul I.; and Wolfe, Jesse D., 4,965,121, Cl. 428-213.000.

Bock, Georg; Gollinger, Franz X.; and John, Thomas, to Man Roland Druckmaschinen AG. Printing machine with separable compact inker including a chambered doctor blade unit. 4,964,336, Cl. 101-157.000.

Bodmer, Viktor: *See*—
Frei, Olaf; Frish, Max; Bodmer, Viktor; and Mizrah, Tiberiu, 4,965,101, Cl. 427-255.000.

Boehringer Mannheim Corp.: *See*—
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Boeing Company, The: *See*—
Falk, R. Aaron, 4,964,687, Cl. 350-96.130.
Hanke, Kurt F.; Lund, Wesley C.; and Feider, David F., 4,965,433, Cl. 219-230.000.
Huggins, Raymond W., 4,964,727, Cl. 356-373.000.
Lubowitz, Hyman R.; and Sheppard, Clyde H., 4,965,336, Cl. 528-170.000.

Boeke, Burkhard; Kalka, Josef; and Winter, Hermann, to Huels Aktiengesellschaft. Preparation of paste forming vinyl chloride polymers with high pressure homogenization. 4,965,328, Cl. 526-212.000.

Boger, John W., to Boehringer Mannheim Corp. Patellar prosthesis. 4,964,867, Cl. 623-20.000.

Boggs, Daniel R.: *See*—
Lysaght, Michael J.; Boggs, Daniel R.; and Ritger, Philip L., 4,964,976, Cl. 210-650.000.

Bognar, Daniel; and Laubacher, Hans-Jorg, to Miller-Johannisberg Druckmaschinen GmbH. Ink roller. 4,964,337, Cl. 101-350.000.

Bohon, William M.: *See*—
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Boissevain, Mathew G., to Measurex Corporation. Digitally incremented linear actuator. 4,964,311, Cl. 74-110.000.

Bokuta, Katsumi: *See*—
Okabe, Kazuo; Bokuta, Katsumi; and Morimoto, Hiroyaki, 4,965,307, Cl. 524-425.000.

Boldwyn, Scott L., to Energy Technology, Inc. Lighting control system and module. 4,965,492, Cl. 315-156.000.

Bolitho, L. I.: *See*—
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Bolitho, Larry I.: *See*—
Kessler, Lawrence J.; and Bolitho, Larry I., 4,964,194, Cl. 17-11.000.

Bollard, Jill W. Nursing blanket. 4,964,172, Cl. 2-104.000.

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Bolte, Steven B.: *See*—
Gruber, Robert J.; Yourd, Raymond A., III; Julien, Paul C.; Bolte, Steven B.; and Knapp, John F., 4,965,158, Cl. 430-106.600.

Bolton, William E.: *See*—
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Bookbinder, Dana: *See*—
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Borden, Inc.: *See*—
Chapman, Dwight E.; and DeProspero, David A., 4,965,408, Cl. 174-35.0MS.
Chawan, Dhyaneshwar B.; Merritt, Carleton; and Matuszak, Edward A., 4,965,082, Cl. 426-331.000.
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Borg Instruments GmbH: *See*—
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Bornhorst, James R., to Valco Cincinnati, Inc. Apparatus and method for selectively coating the inner surface of a hollow body. 4,965,099, Cl. 427-230.000.

Boshagen, Horst; Rosentreter, Ulrich; Lieb, Folker; Oediger, Hermann; Seuter, Friedel; Perzborn, Elisabeth; and Fiedler, Volker-Bernd, to Bayer Aktiengesellschaft. Cycloalkano(1,2-B)indole-sulphonamides, pharmaceutical compositions and use. 4,965,258, Cl. 514-158.000.

Boster, Clark S., to BW/IP International, Inc. Fluid handling apparatus with shaft sleeve and extension. 4,964,646, Cl. 277-5.000.

Boston, Louis R.: *See*—
Ylvisaker, Jon A.; and Boston, Louis R., 4,964,259, Cl. 53-433.000.

Bottau, Francoise; Galand, Claude; and Rosso, Michele, to International Business Machines Corporation. Multi-rate voice encoding method and device. 4,965,789, Cl. 370-79.000.

Bouchet, Rene : *See*—
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Boudewijns, Arnoldus J. J., to U.S. Philips Corporation. Phase detection circuit for stepwise measurement of a phase relation. 4,965,815, Cl. 375-119.000.

Boulian, Eric: *See*—
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Bouquet, Francois: *See*—
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Bouton, Corine: *See*—
Bouton, Vincent; and Bouton, Corine, 4,964,850, Cl. 604-54.000.

Bouton, Vincent; and Bouton, Corine. Method for treating trans-nasal sinus afflictions using a double t-shaped trans-nasal aerator. 4,964,850, Cl. 604-54.000.

Bouzard, Daniel: *See*—
Weber, Abraham; Bouzard, Daniel; Essiz, Munir; Di Cesare, Pierre; Jacquet, Jean-Pierre; and Remuzon, Philippe, 4,965,273, Cl. 514-300.000.

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Box, Richard. Burglar alarm system for multi-unit mailboxes. 4,965,551, Cl. 340-545.000.

Boyd, John M.: *See*—
Westlund, Arnold E., Jr.; Boyd, John M.; and Fleming, Raymond T., 4,964,829, Cl. 445-22.000.

Boyer, Ralph, to Incrediball, Inc. Tethered ball batting practice device. 4,964,634, Cl. 273-26.00E.
Bozzo, Suzanna D.; and Thomas, Ronald W., to Eyzon Corporation. Apparatus for a video recording booth. 4,965,673, Cl. 358-335.000.
BR Communications, Inc.: *See*—
Wilkins, Mark L.; and Wong, Alvin O., 4,965,607, Cl. 343-861.000.
Braasch, Gerd. Grinding element for a grinding tool body. 4,964,245, Cl. 51-407.000.
Bradley, Ralph H., Jr., to North American Philips Corporation. Lenticular arrays for front projection screens and contrast improving method and device. 4,964,695, Cl. 350-129.000.
Braine, Mark D.; Kirby, Ralph; Schultz, Donald W.; Tuttle, Richard G.; Ferg, Nelson M.; Hickman, John B.; and Webb, William C., to W. P. Hickman Company. Coping assembly for a non-uniform parapet wall. 4,964,248, Cl. 52-60.000.
Branan, M. William, Jr.; and Wetters, John D., to Motorola, Inc. Radio having optical controls and method of optically controlling same. 4,964,693, Cl. 350-96.290.
Brandes, Wilhelm: *See*—
Heinemann, Ulrich; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,965,265, Cl. 514-250.000.
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Brandstrom, Arne E.; Lindberg, Per L.; Starke, Carl I.; and Sunden, Gunnel E., to AB Hassle. Therapeutically active chloro substituted benzimidazoles. 4,965,269, Cl. 514-253.000.
Brannen, William T.; Burt, Gerald D.; and McDonald, Randolph A., to Elco Corporation. Phosphite amine lubricant additives. 4,965,002, Cl. 252-32.500.
Brannigan, Lawrence H.; Brinker, Ronald J.; Kaufman, Robert J.; and Metz, Suzanne, to Monsanto Company. Benzhydryl compounds as herbicide antidotes. 4,964,893, Cl. 71-88.000.
Branson, Mark E.; and Edelman, Paul F., to KCL Corp. Flexible container having tamper evident closure. 4,964,739, Cl. 383-5.000.
Braun, Peter B.; Hauser, Herbert P.; and Stefanescu, Alexander, to DOM-Sicherheitstechnik GmbH & Co. KG. Locking device and reversible key. 4,964,288, Cl. 70-406.000.
Brautigam, Kathe L.; and Gorman, William W., Jr., to E-C Apparatus Corporation. Elution method and device. 4,964,961, Cl. 204-182.300.
Bravo, Francesco, to Bravo, S.p.A. Ellipsoidal pasteurizer for food mixtures. 4,964,333, Cl. 99-455.000.
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Breyer, Karl-Hermann; and Starp, Franz, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Counterbalanced coordinate-measuring instrument. 4,964,221, Cl. 33-503.000.
Breznak, Jeffrey M.: *See*—
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Bridges, William G.: *See*—
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Brinkman, Egbert; and Bantjes, Adriaan, to Stichting Voor de Technische Wetenschappen. Method for applying a blood-compatible coating to polyether-urethane moulded articles and the polymether-urethane moulded articles coated in this way. 4,965,112, Cl. 428-36.910.
Bristol-Myers Company: *See*—
Saulnier, Mark G.; and Langley, David R., 4,965,348, Cl. 536-17.200.
Weber, Abraham; Bouzard, Daniel; Essiz, Munir; Di Cesare, Pierre; Jacquet, Jean-Pierre; and Remuzon, Philippe, 4,965,273, Cl. 514-300.000.
Bristol-Myers Squibb Company: *See*—
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Wood, Geoffrey A., 4,965,024, Cl. 264-0.500.
Brodecki, James; Tanguay, William; and Fiene, Dale, to Seatt Corporation. Combustion products detector having self-actuated periodic testing signal. 4,965,556, Cl. 340-628.000.
Brois, Stanley J.; and Gutierrez, Antonio, to Exxon Research and Engineering Co. Thio-bis-(alkyl lactone acid esters) and thio-bis-(hydrocarbyl diacid esters) are useful additives for lubricating compositions. 4,965,375, Cl. 549-320.000.
Broken Hill Proprietary Co., Ltd.: *See*—
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Bromine Compounds Limited: *See*—
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Brother Kogyo Kabushiki Kaisha: *See*—
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Brown, Max R., to International Business Machines Corp. Distinguishing nested structures by color. 4,965,765, Cl. 364-900.000.
Brown, Richard K.; and Stichman, Robert W., to Wyo-Ben, Inc. Grouting composition. 4,964,918, Cl. 106-811.000.
Brown, Roger R.: *See*—
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Broxmeyer, Charles. Collision avoidance system for automatically controlled vehicles moving at short headways. 4,965,583, Cl. 342-42.000.
Bruce, Melvin: *See*—
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Brueckner, Christiane: *See*—
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Brugerolle, Jean-Renaud; and Ferenczi, Laurent, to L'Air Lquide, Societe Anonyme pour l'etude et l'Exploitation des Procedes Georges Claude. Process and equipment for separating a component of intermediate permeability from a gaseous mixture. 4,964,886, Cl. 55-16.000.
Bruneval, Gilles, to Societe Anonyme dite : Les Cables de Lyon. Splice for joining the armoring of two wire-armored cables, and a method of making the splice. 4,965,411, Cl. 174-89.000.
Bruno, Adrian A.; Diwisch, Thomas; Chrzastek, Ralph; and Casanzio, Richard, to Middleby Marshall Inc. Baking oven. 4,964,392, Cl. 126-21.00A.
Brunswick Corporation: *See*—
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Fortney, John D., 4,965,869, Cl. 343-781.00R.
Hansen, Steven K., 4,964,387, Cl. 123-425.000.
Hubbell, James C.; Stiller, Gordon L.; and Liegeois, David D., 4,964,454, Cl. 164-246.000.
Kusche, David W., 4,964,380, Cl. 123-52.0MF.
Newman, Neil A.; Bankstahl, Herbert A.; Griffiths, John M.; Forsgren, Lyle M.; and Beck, Wayne T., 4,964,823, Cl. 440-61.000.
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Bryce, Rod H. Liquid flow measuring device. 4,964,307, Cl. 73-861.000.
Bseisu, Amjad A.: *See*—
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Budge, John R.; and Attig, Thomas G., to Standard Oil Company, The. Vapor-phase hydrogenation of maleic anhydride to tetrahydrofuran and gamma-butyrolactone. 4,965,378, Cl. 549-508.000.
Buecher, Roger W.: *See*—
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Bunawerke Huls GmbH: *See*—
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Bundo, Isao; Hannuki, Kouzou; and Ito, Mikiya, to Honda Giken Kogyo Kabushiki Kaisha. Working method and apparatus for workpiece being conveyed. 4,964,497, Cl. 198-341.000.

Burgdorf, Jochen; Reinartz, Hans-Dieter; Steffes, Helmut; Von Hayn, Holger; Volz, Peter; Wupper, Hans; Buschmann, Gunther; Beck, Erhard; Dehio, Gottfried; Dinkel, Dieter; and Rausch, Juergen, to Alfred Teves GmbH. Anti-lock hydraulic brake system. 4,964,681, Cl. 303-116.000.

Burkhead, Wayne Z.; Dale, James L.; and Burkinshaw, Brian D., to Intermedics Orthopedics, Inc. Glenoid prosthesis and method of use. 4,964,865, Cl. 623-19.000.

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Burkinshaw, Brian D.: *See*—
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Burns, Robert V.; and Gupta, Sanjay, to Siemens Transmission Systems, Inc. Overload detector and protection circuit. 4,965,692, Cl. 361-18.000.

Burrell, Donald C.: *See*—
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Burt, Gerald D.: *See*—
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Buschbom, Floyd E., to Van Dale, Inc. Impeller assembly. 4,964,502, Cl. 198-642.000.

Buschmann, Ernst: *See*—
Huellmann, Michael; Becker, Rainer; Lauterbach, Gerald; Buschmann, Ernst; Eckhardt, Heinz; Himmele, Walter; and Brueckner, Christiane, 4,965,376, Cl. 549-423.000.

Buschmann, Gunther: *See*—
Burgdorf, Jochen; Reinartz, Hans-Dieter; Steffes, Helmut; Von Hayn, Holger; Volz, Peter; Wupper, Hans; Buschmann, Gunther; Beck, Erhard; Dehio, Gottfried; Dinkel, Dieter; and Rausch, Juergen, 4,964,681, Cl. 303-116.000.

Bushman, Norman P.: *See*—
Astrope, Myrle E.; and Bushman, Norman P., 4,964,752, Cl. 404-92.000.

Butterfield, Brian J., to Basic Engineering Ltd. Apparatus for simulating flames. 4,965,707, Cl. 362-96.000.

BW/IP International, Inc.: *See*—
Boster, Clark S., 4,964,646, Cl. 277-5.000.

Cabre Castellvi, Juan; Diago Meseguer, Jose ; Esteve Bianchini, Asuncion; Lenhardt Padro, Carlos E.; and Sans Pitarch, Esteve, to Gema, S. A. N,N'-carbonyl-bis-(4-ethyl-2,3-dioxo)-piperazine. 4,965,358, Cl. 544-357.000.

Cadeo, Angelo; and Zellweger, Ruedi, to Miteco AG; and Cadeo, Angelo. Method for continuously producing a flowable mixture. 4,964,732, Cl. 366-159.000.

Cadotte, John E.; Racchini, Joel-Raphael; and Petersen, Robert J., to FilmTec Corporation. Use of treated composite polyamide membranes to separate concentrated solute. 4,964,998, Cl. 210-654.000.

Cadwell, Peter F.; and Anglin, Noah L., to Poget Computer Corporation. Two-part casing latching mechanism. 4,964,661, Cl. 292-87.000.

CAE-Link Corporation, Link Flight: *See*—
Kraemer, Werner, 4,965,753, Cl. 364-522.000.

Caldwell, Kevin G.; Lischynsky, Steve J.; and Seregelyi, Elza V., to Northern Telecom Limited. Fiber optic connector element and method for its use. 4,964,688, Cl. 350-96.200.

Calhoun, Clyde D., to Minnesota Mining and Manufacturing Company. Lift off patterning process on a flexible substrate. 4,964,945, Cl. 156-632.000.

California Institute of Technology, The: *See*—
Sharma, Pramod K.; Voecks, Gerald E.; and Gavalas, George R., 4,964,881, Cl. 44-620.000.

Callihan, Timothy N. Cargo restrainer. 4,964,771, Cl. 410-118.000.

Calmes, Lonnie K.: *See*—
Ulich, Bobby L.; Calmes, Lonnie K.; and Elkins, William P., 4,964,721, Cl. 356-5.000.

Cameazind, Hugo, to Ciba-Geigy Corporation. Aminomethyl derivatives of monothiocarbamates and dithiocarbamates as additives for lubricants. 4,965,005, Cl. 252-47.000.

Campbell, Thomas D.: *See*—
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Can, Luke: *See*—
Jeng, Bor-Shenn; Chang, Gan-How; Chang, Kuang-Yao; Liu, Jsann-Shyong; Lin, Jangkeng; Hwang, Jei-Shoung; Wu, T-Min; Shyu, Keh-Hwa; Miou, Char-Hin; and Can, Luke, 4,965,458, Cl. 364-419.000.

Canfield, Barth A.; and Fling, Russell T., to RCA Licensing Corporation. Apparatus for digitally controlling the D.C. value of a processed signal. 4,965,669, Cl. 358-171.000.

Caniglia, Joseph E.; and Caniglia, Roberto G. Bladder for fuel tank. 4,964,531, Cl. 220-855.000.

Caniglia, Roberto G.: *See*—
Caniglia, Joseph E.; and Caniglia, Roberto G., 4,964,531, Cl. 220-855.000.

Canon Kabushiki Kaisha: *See*—
Arai, Ryuichi; Haruta, Masahiro; Yamamoto, Nobuko; Yano, Tetsuya; Kishi, Hiroyoshi; and Sakuranaga, Masanori, 4,965,174, Cl. 430-340.000.
Hasegawa, Kouyo, 4,965,440, Cl. 235-487.000.
Hatanaka, Katsunori; Uzawa, Shunichi; Nakagawa, Katsumi; and Komatsu, Toshiyuki, 4,965,570, Cl. 340-825.790.
Hiroi, Masakazu; Naito, Masataka; and Murakami, Koichi, 4,965,629, Cl. 355-50.000.
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Shinohara, Hayato; and Tsukada, Isao, 4,965,608, Cl. 346-1.100.
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Tomida, Yasuko; and Koike, Shoji, 4,965,609, Cl. 346-1.100.
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Udagawa, Yoshiro; and Takiguchi, Hideo, 4,965,664, Cl. 358-80.000.
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Canon Kabushiki Kisha: *See*—
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Canterra Energy Ltd.: *See*—
Adamache, Ion I., 4,964,981, Cl. 209-166.000.

Canty, Thomas M. High Pressure/temperature camera. 4,965,601, Cl. 354-63.000.

Capon, Daniel J.; Lawn, Richard M.; Levinson, Arthur D.; Vehar, Gordon A.; and Wood, William I., to Genentech, Inc. Preparation of functional human factor VIII in mammalian cells using methotrexate based selection. 4,965,199, Cl. 435-69.600.

Caprarese, Vincent; and Goguillon, Didier, to U.S. Philips Corporation. Method of and system for scrambling/descrambling sound. 4,965,826, Cl. 380-19.000.

Caraballo, Damian F. Terminal connector clamp. 4,964,819, Cl. 439-773.000.

Carboxyque Francaise: *See*—
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Carl-Zeiss-Stiftung, Heidenheim/Brenz: *See*—
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Carlson, Glenn R., to Monsanto Company. Certain-2,6-diphenyl-1,4-dihydro-4-oxo-nicotinates which are useful for inducing male sterility in cereal grain plants. 4,964,896, Cl. 71-94.000.

Carpenter, Larry L.; Morrell, Mark L.; and Schrauth, Peter A., to Corning Incorporated. Apparatus for molding glass molds. 4,964,903, Cl. 65-275.000.

Carr, Thomas G.; Oliver, Donald; James, John; and Rayfield, Robert, to Otis Elevator Company. Training kit. 4,964,804, Cl. 434-219.000.

Carroll, Kenneth J.; and Pless, Benjamin D., to Ventritex, Inc. Implantable cardiac defibrillator employing a switched capacitor stage having a non-50/50 duty cycle. 4,964,406, Cl. 128-419.00D.

Carter, Stephen J.: *See*—
Clifton, Michael D.; and Carter, Stephen J., 4,965,384, Cl. 556-110.000.

Carthage Machine Company: *See*—
Farrell, Eugene A.; and Robinson, Mark D., 4,964,447, Cl. 144-176.000.

Caruso, Michele; Suarato, Antonino; Angelucci, Francesco; and Arcamone, Federico, to Farmitalia Carlo Erba S.R.L. 4-demethoxy-4-amino-anthracyclines. 4,965,351, Cl. 536-6.400.

Casanzio, Richard: *See*—
Bruno, Adrian A.; Diwisch, Thomas; Chrzastek, Ralph; and Casanzio, Richard, 4,964,392, Cl. 126-21.00A.

Case, Paul D.; and Dittrich, David J., to British-American Tobacco Company, Ltd. Smoking articles. 4,964,427, Cl. 131-365.000.

Casey, Irene; and Melzer, Helmut L. Cleaner and disinfectant with dye. 4,965,063, Cl. 424-7.100.

Casey, John; Dobb, Roy T.; and Jeffcoat, Roger. Preparation of dicarboxylic acid. 4,965,201, Cl. 435-134.000.

Casida, John E.; Palmer, Christopher J.; Larkin, John P.; and Smith, Ian H., to University of California, The Regents of the. Pesticidal compounds. 4,965,257, Cl. 514-149.000.

Casio Computer Co., Ltd.: *See*—
Kawamura, Masao; and Usui, Minoru, 4,965,566, Cl. 340-793.000.
Yarita, Yoshio; and Kawamura, Yoshihiro, 4,964,947, Cl. 156-645.000.

Catena, Robert, to Sun Chemical Corporation. Anti-static varnish compositions. 4,964,916, Cl. 106-228.000.

Cella, James A.: *See*—
Peters, Edward N.; Bookbinder, Dana; and Cella, James A., 4,965,337, Cl. 528-353.000.

Celotex Corporation, The: *See*—
Conroy, Alan P., 4,965,031, Cl. 264-122.000.

Center for Orthotics Design, Inc.: *See*—
Poplawski, Christopher, 4,964,628, Cl. 272-70.000.

Central Glass Company, Limited: *See*—
Maruyama, Yutaka; Komoriya, Haruhiko; and Tsutsumi, Kentaro, 4,965,339, Cl. 528-353.000.

Centre National de la Recherche Scientifique: *See*—
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Ceramiques Techniques Desmarquest: *See*—
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Ceresara, Sergio: *See*—
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Cerofolini, Gianfranco, to SGS Microelettronica SpA. Method for the manufacturing of insulated gate field effect transistors (IGFETS) having a high response speed in high density integrated circuits. 4,965,219, Cl. 437-40.000.

Cetus Corporation: *See*—
Mullis, Kary B.; Erlich, Henry A.; Gelfand, David H.; Horn, Glenn; and Saiki, Randall K., 4,965,188, Cl. 435-6.000.

Chamberlin, Jeffery L.: *See*—
Fredriksson, Borje; and Chamberlin, Jeffery L., 4,964,733, Cl. 366-336.000.

Chamberlin, Justin M. Snowboard boot binder attachments. 4,964,649, Cl. 280-618.000.

Chan, Luen C.; and Kautz, Kenrick W., to Harris Corporation. Compression and reconstruction of color aeronautical chart images. 4,965,845, Cl. 382-56.000.

Chandross, Edwin A.: *See*—
Blitchington, Frank H.; Chandross, Edwin A.; and Shepherd, Lloyd, 4,965,208, Cl. 436-5.000.

Chang, Chun-Hsiung. Bar of soap having a recessed portion for receiving another, used, piece of soap. 4,965,008, Cl. 252-134.000.

Chang, Donald C.; Wong, Mon N.; Patin, Robert J.; and Chang, Stanley S., to HAC. Lightweight, low profile phased array antenna with electromagnetically coupled integrated subarrays. 4,965,605, Cl. 343-700.0MS.

Chang, Gan-How: *See*—
Jeng, Bor-Shenn; Chang, Gan-How; Chang, Kuang-Yao; Liu, Jsann-Shyong; Lin, Jangkeng; Hwang, Jei-Shoung; Wu, T-Min; Shyu, Keh-Hwa; Miou, Char-Hin; and Can, Luke, 4,965,458, Cl. 364-419.000.

Chang, Hershow; Kim, Seong; and Motoyama, Tetsuro, to Ricoh Company, Ltd.; and Ricoh Corporation. Laser printer controller flexible frame buffer architecture which allows offsetting different input/output data widths. 4,965,748, Cl. 364-519.000.

Chang, Hui-Hsiung. Structure of an ashtray, capable of self-cleaning and automatic fire-extinguishing. 4,964,425, Cl. 131-237.000.

Chang, Jih-Cheng. Warning device to alert passers-by before opening an automobile door. 4,965,546, Cl. 340-468.000.

Chang, Kin-Shiung; Armer, Thomas A.; and Bridges, William G., to Olin Corporation. Process for manufacturing plastic pin grid arrays and the product produced thereby. 4,965,227, Cl. 437-207.000.

Chang, Kuang-Yao: *See*—
Jeng, Bor-Shenn; Chang, Gan-How; Chang, Kuang-Yao; Liu, Jsann-Shyong; Lin, Jangkeng; Hwang, Jei-Shoung; Wu, T-Min; Shyu, Keh-Hwa; Miou, Char-Hin; and Can, Luke, 4,965,458, Cl. 364-419.000.

Chang, Stanley S.: *See*—
Chang, Donald C.; Wong, Mon N.; Patin, Robert J.; and Chang, Stanley S., 4,965,605, Cl. 343-700.0MS.

Chang, Yen-Hwei, to Ming-Chin Wu. Methods for preparing lead lanthanum zirconatetitanate powders with carbonate processes. 4,965,056, Cl. 423-263.000.

Chang, Yun-Chi. Socket wrench device for rotating a spark plug. 4,964,319, Cl. 81-58.300.

Chao, Chien-Chung, to UOP. Selective adsorption on magnesium-containing clinoptilolites. 4,964,889, Cl. 55-58.000.

Chao, Tai-Hsiang; Targos, William M.; and Moser, Mark D., to UOP. Reforming catalyst with homogeneous metals dispersion. 4,964,975, Cl. 208-139.000.

Chapman, Dwight E.; and DeProspero, David A., to Borden, Inc. Composite sheet material for electromagnetic radiation shielding. 4,965,408, Cl. 174-35.0MS.

Chatterjee, Shyam S.: *See*—
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Chawan, Dhyaneshwar B.; Merritt, Carleton; and Matuszak, Edward A., to Borden, Inc. Method for making alimentary paste or pasta products without the conventional drying step. 4,965,082, Cl. 426-331.000.

Chaygneaud-Dupuy, Francois. Covering foils for windows and packing boxes provided with such windows. 4,964,563, Cl. 229-162.000.

Chemical Reclamation Services, Inc.: *See*—
Leath, E. L. "Buddy", 4,964,914, Cl. 106-745.000.

Chen, Hanks. Packing cases for frozen shrimps. 4,964,507, Cl. 206-557.000.

Chen, Kirk C. S., to Washington Research Foundation. Detection of microbial beta-lactamase. 4,965,193, Cl. 435-18.000.

Chen, Shieh-Shung J.; and Arison, Byron H., to Merck & Co., Inc. Process for the preparation of 3-keto, 5-hydroxy simvastatin analogs. 4,965,200, Cl. 435-125.000.

Chenot, Richard H.: *See*—
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Cheon, Thomas V.: *See*—
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Chesnut, Gary R.: *See*—
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Chesters, Stephen: *See*—
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Childers, Jimmie D.; and Norwood, Roger D., to Texas Instruments Incorporated. Glitch suppression circuit. 4,965,474, Cl. 307-542.000.

Chiou, Minshon J., to Du Pont de Nemours, E. I., and Company. Process for spinning high-strength, high-modulus aromatic polyamides. 4,965,033, Cl. 264-180.000.

Chisso Corporation: *See*—
Matsuda, Minoru, 4,965,340, Cl. 528-382.000.
Uchida, Manabu; Yoshida, Naoyuki; and Kaneoya, Masakazu, 4,965,018, Cl. 252-299.610.

Choi, Kyu H.; Lee, Jung H.; Lee, Heyung-Sub; Yook, Tae-Yoon; and Bae, Dong-Joo, to SamSung Electronics Co., Ltd. Method for manufacturing poly-crystal sillicon having high resistance. 4,965,214, Cl. 437-24.000.

Chou, Alan F., to Keystone International, Inc. Method and means for mounting valve member on valve stem. 4,964,432, Cl. 137-15.000.

Chou, Ta-Sen; Heath, Perry C.; and Patterson, Lawrence E., to Eli Lilly and Company. Process for and intermediates of 2',2'-difluoronucleosides. 4,965,374, Cl. 549-313.000.

Christiansen, Uwe, to Heraeus Quarzschmelze GmbH. Apparatus for drying finely divided solids. 4,964,227, Cl. 34-175.000.

Christine, William C.; Lyons, Steffen; Posey, John; Schmidt, Josef; and Herschman, George J., to Baxter International Inc. Apparatus for sealing and severing a web of film. 4,964,944, Cl. 156-515.000.

Chrysler Corporation: *See*—
Benford, Howard L.; Leising, Maurice B.; and Holbrook, Gerald L., 4,964,506, Cl. 192-106.00F.
Holbrook, Gerald L.; and Leising, Maurice B., 4,965,735, Cl. 364-424.100.
Leising, Maurice B.; Benford, Howard L.; Lindsay, Michael R.; and McCombie, Jay C., 4,965,728, Cl. 364-424.100.
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Chrzastek, Ralph: *See*—
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Chubu Electric Power Company Inc.: *See*—
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Chul, Kim K. Device for displaying operation of a microcomputer and method of displaying operation thereof. 4,964,803, Cl. 434-118.000.

Chum, Helena L.; and Filardo, Giuseppe, to Midwest Research Institute. Supercritical separation process for complex organic mixtures. 4,964,995, Cl. 210-634.000.

Churchill, John W., to Southport Enterprises. Heater unit. 4,965,436, Cl. 219-544.000.

Chyla, Thomas; and Meinherz, Manfred, to Simens Aktiengesellschaft. Metal-clad, compressed gas-blast circuit-breaker. 4,965,419, Cl. 200-147.00R.

Cianflone, Joseph A.: *See*—
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Ciba-Geigy Corporation: *See*—
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Frey, Christian; Dill, Bernd; and Schmid, Konrad, 4,964,876, Cl. 8-643.000.
Janssen, Robert A., 4,965,026, Cl. 264-22.000.
Lang, Marc, 4,965,260, Cl. 514-192.000.
Leeson, Lewis J., 4,965,074, Cl. 424-449.000.
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Petitjean, Pierre, 4,965,880, Cl. 364-468.000.
Reinert, Gerhard; and Binz, Jorg, 4,964,871, Cl. 8-115.590.

Schneider, Hans-Dieter, 4,965,390, Cl. 558-7.000.
Steinmann, Alfred, 4,965,316, Cl. 525-100.000.
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Cimillo, Paul J. Multi-purpose flexible devices, method of making same and articles made therefrom. 4,965,115, Cl. 428-131.000.
Ciminelli, Michael A.; Buck, Jack; Weaver, Charles G.; and Fowler, Darryle E., to Stone Construction Equipment, Inc. Three roll compactor. 4,964,753, Cl. 404-122.000.
Ciolczyk, Jean-Pierre; and Simon, Jean-Michel, to Hutchinson. Resilient supports with composite cables embedded in elastomeric material. 4,964,624, Cl. 267-81.000.
Cipriano, Robert A.: *See*—
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Civin, Curt I., to Johns Hopkins University, The. Human stem cells and monoclonal antibodies. 4,965,204, Cl. 435-240.270.
CL Pharma Aktiengesellschaft: *See*—
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Clar, Donald J., Jr.: *See*—
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Clarion Co., Ltd.: *See*—
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Clark Equipment Company: *See*—
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Clark, Gary E., to Parker, Wade, a part interest. Combination plumb-/level instrument for a try square. 4,964,219, Cl. 33-451.000.
Clark, Robert T.; and Crist, Rick A., to Hughes Aircraft Company. Gain equalizer for microwave balanced amplifier configuration. 4,965,527, Cl. 330-124.00R.
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Clausen, Glenn A.; Kuhn, Karen A.; and Weldon, Kathryn P., to Texaco Inc. Microscopic examination of ebullated bed process effluent to control sediment. 4,964,974, Cl. 208-108.000.
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Cleworth, Marianne. Weed remover. 4,964,472, Cl. 171-11.000.
Clifford, Richard P.: *See*—
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Clifton, Michael D.; and Carter, Stephen J., to Amoco Corporation. The production of copper amine salt complexes for catalysts for the oxidative coupling of alkylphenols. 4,965,384, Cl. 556-110.000.
Clini-Med Ltd.: *See*—
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Clinical Product Development Ltd.: *See*—
Peters, Joseph L., 4,964,417, Cl. 128-850.000.
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Fong, Ronald A.; and Kong, Stephen B., 4,964,870, Cl. 8-111.000.
CMB Foodcan p.l.c.: *See*—
Hammond, John M., 4,965,047, Cl. 422-58.000.
Coca-Cola Company, The: *See*—
Kirschner, Jonathan; and Saunders, William J., 4,964,532, Cl. 222-1.000.
Coffelt, Steven R.; and Darston, Thomas W., to Harris Corporation. D channel monitor. 4,965,795, Cl. 370-110.100.
Coffey, Donald T.; Oltz, Charles H.; Roth, Donald D.; and Baran, Richard J., to G.B. Electrical Inc. Electrical box mounting bracket. 4,964,525, Cl. 220-3.900.
Coffman, Paul M., to Rampart Packaging Inc. Method for making screw cap jar. 4,964,205, Cl. 29-401.100.
Coffman, Randall R., to Norman Dryer Company, Inc. Dryer door mechanism. 4,964,228, Cl. 34-242.000.
Coherent, Inc.: *See*—
Saunett, Michael W.; Paitich, Ronald; and Aurich, Edward L., 4,964,735, Cl. 374-32.000.
Coherent Systems, Inc.: *See*—
Leahey, Edward; Zinner, Alexander J., III; and Howard, Christopher A., 4,964,410, Cl. 128-696.000.
Cohn, Robert J.: *See*—
Kolvites, Albert; Cohn, Robert J.; Welsch, John H.; Sickles, Willard J.; and Balazek, David T., 4,964,350, Cl. 108-110.000.
Cole, Rodney D. Cosmetics applicator. 4,964,429, Cl. 132-218.000.
Cole, Ronald E., to Emhart Industries, Inc. Electromechanical timer with improved bussing retention. 4,965,859, Cl. 200-38.00R.
Coleman, Mark D.: *See*—
Thayer, Larry J.; and Coleman, Mark D., 4,965,751, Cl. 364-521.000.
Colgate-Palmolive Company: *See*—
Nimmey, Alan; and Hayes, Harry, 4,964,538, Cl. 222-92.000.
Colla, Jeannine O.: *See*—
Thoma, Paul E.; and Colla, Jeannine O., 4,965,698, Cl. 361-286.000.
Colli, Luigi; Badiali, Roberto; and Marangone, Nereo, to Savio, S.p.A. Bobbin winding method comprising variable-duration interventions for restoring yarn continuity, and devices for its implementation. 4,964,581, Cl. 242-35.60R.
Collier, Harry B. Radio controlled model vehicle having coordinated sound effects system. 4,964,837, Cl. 446-409.000.
Collins, Walter W., to Russell, A. G. Locking knife and sheath assembly. 4,964,554, Cl. 224-232.000.
Colombo, Giovanni. Apparatus for instantaneously destroying used injection syringe needles. 4,965,426, Cl. 219-68.000.
Color Custom, Inc.: *See*—
Roberts, Edward A.; Spittal, Douglas W.; and Kisiel, Stanley T., 4,965,103, Cl. 428-31.000.
Columbia University in the City of New York, The Trustees of: *See*—
Koester, Charles J., 4,964,717, Cl. 351-219.000.
Combs, Gary D. Removable cover for eyeglass nose pad. 4,964,716, Cl. 351-139.000.
Cominco Ltd.: *See*—
Michalik, Leo K.; and Mussio, Segio G., 4,964,471, Cl. 169-57.000.
Commissariat a l'Energie Atomique: *See*—
Deroux-Dauphin, Patrice; Sibuet, Henri; and Dupeux, Thierry, 4,964,212, Cl. 29-852.000.
Picard, Bernard, 4,965,441, Cl. 250-201.300.
Poujois, Robert, 4,965,578, Cl. 341-156.000.
Commonwealth of Australia: *See*—
Van Loeuwen, Hendrikus J.; Freeman, Norman H.; Sutherland, Brian J.; and Jameson, Graeme W., 4,965,078, Cl. 424-40.000.
Compagnie de Raffinage et de Distribution Total France: *See*—
Mauleon, Jean-Louis; Siguad, Jean-Bernard; Pontier, Renaud; and Hoffmann, Frederic, 4,965,232, Cl. 502-43.000.
Compagnie Europeenne de Composants Electroniques LCC: *See*—
Deroux-Dauphin, Patrice; Sibuet, Henri; and Dupeux, Thierry, 4,964,212, Cl. 29-852.000.
Compagnie Generale d'Electricite: *See*—
Le Mehaute, Alain; Quiniou, Jean-Francois; Roques-Carmes, Claude; Wehbi, Dalloul; and Derossis, Antoine, 4,965,746, Cl. 364-518.000.
Compagnie Generale des Etablissements Michelin: *See*—
Reiniche, Andre, 4,964,621, Cl. 266-90.000.
Comparat, Vincent: *See*—
Menet, Jacques; and Comparat, Vincent, 4,965,491, Cl. 315-111.210.
Confalonieri, Pierangelo: *See*—
Nicollini, Germano; and Confalonieri, Pierangelo, 4,965,468, Cl. 307-362.000.
Conklin, Norman T. Blade sharpener. 4,964,241, Cl. 51-135.00R.
Conn, Sidney H. Electrically insulated fuel tank for hot air balloon and method of constructing same. 4,964,930, Cl. 156-85.000.
Conner Peripherals, Inc.: *See*—
Lin, Joseph T., 4,965,476, Cl. 310-51.000.
Stefansky, Frederick M., 4,965,684, Cl. 360-78.120.
Conners, John M. Miter saw track. 4,964,449, Cl. 144-286.00R.
Conoco Inc.: *See*—
Jones, Richard L., 4,965,305, Cl. 524-349.000.
Jones, Richard L., 4,965,306, Cl. 524-351.000.
Conrow, Ramson B.: *See*—
Nair, Vijay G.; Conrow, Ramson B.; Wang, Bosco S.; and Ruszala-Mallon, V. M., 4,965,284, Cl. 514-443.000.
Conroy, Alan P., to Celotex Corporation, The. Continuous production of gypsum board. 4,965,031, Cl. 264-122.000.
Contico International Inc.: *See*—
Dickinson, Thomas, 4,964,650, Cl. 280-641.000.
Continental Accessories, Inc.: *See*—
Osborne, David B., Sr., 4,965,704, Cl. 362-81.000.
Conway, Hugh T.: *See*—
Losada, Robert J.; and Conway, Hugh T., 4,964,413, Cl. 128-766.000.
Cook, Lacy G., to Hughes Aircraft Company. Multi-focal length, multi-field of view three mirror anastrigmat. 4,964,706, Cl. 350-505.000.
Cooper Industries, Inc.: *See*—
Hamm, Sidney R., 4,965,407, Cl. 174-31.00R.
Sobotka, Edward W., Jr.; and Piraino, Martin P., Jr., 4,965,414, Cl. 200-50.00A.
Cornelison, Kenneth E.: *See*—
Nelson, John C.; and Cornelison, Kenneth E., 4,964,691, Cl. 350-96.230.
Cornely, Wolfgang: *See*—
Muller, Hanns P.; Kappa, Manfred; Vehlewald, Peter; Meyer, Frank; Cornely, Wolfgang; and Mehesch, Hans E., 4,965,292, Cl. 521-110.000.
Corning Incorporated: *See*—
Carpenter, Larry L.; Morrell, Mark L.; and Schrauth, Peter A., 4,964,903, Cl. 65-275.000.
Cortez, Fermin M.: *See*—
Bertram, James L.; Walker, Louis L.; McCrary, Avis L.; and Cortez, Fermin M., 4,965,324, Cl. 525-507.000.
Coull, David: *See*—
Armell, Richard A.; and Coull, David, 4,964,460, Cl. 166-113.000.

Coulmier, Jean-Pol; Lepere, Guy; and Kunegel, Jacques, to Thomson CSF. Method and devices for translation along the axis of frequencies of the modulus of the transfer function of a filter. 4,965,584, Cl. 342-159.000.

Coulmier, Jean-Pol: *See*—
Lepere, Guy; Kunegel, Jacques; and Coulmier, Jean-Pol, 4,965,585, Cl. 342-160.000.

Counsell, Raymond E.; Meyer, Karen L.; and Schwendner, Susan W., to University of Michigan, The. Radioiodinated phospholipid ether analogues. 4,965,391, Cl. 558-169.000.

Covarrubias, Jesse: *See*—
House, Randall; and Covarrubias, Jesse, 4,964,750, Cl. 404-6.000.

Craft, Scott; Pfizenmayer, Henry L.; and Wernett, Frederick C., to Motorola Inc. Hybrid amplifier. 4,965,526, Cl. 330-66.000.

Crawford, Howard E., III: *See*—
Paccoret, Claudio S.; and Crawford, Howard E., III, 4,964,825, Cl. 441-74.000.

Crawford, James J., to Frezzolini Electronics Inc. Stand-by power supply. 4,965,462, Cl. 307-66.000.

Cray Computer Corporation: *See*—
Cray, Seymour R., 4,965,863, Cl. 307-450.000.

Cray, Seymour R., to Cray Computer Corporation. Gallium arsenide depletion made MESFIT logic cell. 4,965,863, Cl. 307-450.000.

Criss, Russell C., to PPG Industries, Inc. Method of making architectural coating with interference colors. 4,964,963, Cl. 204-192.270.

Crist, Rick A.: *See*—
Clark, Robert T.; and Crist, Rick A., 4,965,527, Cl. 330-124.00R.

Crittenden, John P. Multiple lever side pole wrench. 4,964,664, Cl. 294-15.000.

Cromheecke, Eric L. A.; and Strong, Russell W., to Ford New Holland, Inc. Low profile mounts for axial flow combine rotor. 4,964,838, Cl. 460-66.000.

Crommen, Jan: *See*—
Schacht, Etienne; and Crommen, Jan, 4,965,397, Cl. 560-60.000.

Crosfield Electronics Limited: *See*—
Stansfield, Peter W.; and Reed, Alastair, 4,965,754, Cl. 364-526.000.

Cross, Peter S.: *See*—
Elliott, Scott S.; Bray, Robert C.; Bagwell, Timothy L.; and Cross, Peter S., 4,965,479, Cl. 310-313.00D.

Crossley, P. A.; and Nishihara, H. Keith, to Schlumberger Technologies, Inc. Method and apparatus for measuring feature dimensions using controlled dark-field illumination. 4,965,842, Cl. 382-8.000.

Crow, John Q. Pecan nut collector. 4,964,665, Cl. 294-19.200.

Crum, Bruce P. Fireplace restoration unit. 4,964,396, Cl. 126-508.000.

Crutcher, John P.; Hueil, J. Charles; and Juska, Donald D., to Sencorp. Electro-mechanical fastener driving tool. 4,964,558, Cl. 227-8.000.

Csongor, Desider G.: *See*—
Alzner, Bernard G.; and Csongor, Desider G., 4,964,730, Cl. 366-81.000.

Cuddihy, James W.: *See*—
Harvey, John C.; and Cuddihy, James W., 4,965,825, Cl. 380-9.000.

Cudennec, Claude: *See*—
Vincent, Michel; Remond, Georges; and Cudennec, Claude, 4,965,250, Cl. 514-18.000.

Cummins-Allison Corporation: *See*—
Rasmussen, James M., 4,964,495, Cl. 194-344.000.

Cummins, Robert: *See*—
Kirilloff, Victor V.; Cummins, Robert; and Benson, William A., 4,964,346, Cl. 105-225.000.

Cunnane, Stephen C.: *See*—
Horrobin, David F.; Cunnane, Stephen C.; and Manku, Mehar S., 4,965,075, Cl. 424-638.000.

Cuomo, John; Greenberg, Richard S.; and Olson, Richard E., to Du Pont de Nemours, E. I., and Company. Antifungal carbinols. 4,965,280, Cl. 514-383.000.

Cuomo, John; Greenberg, Richard S.; and Olson, Richard E., to Du Pont de Nemours, E. I., and Company. Antifungal carbinols. 4,965,281, Cl. 514-399.000.

Cure, Omer; and Bollen, Theo P. C., to Electro-Nite Co. Immersion measuring probe for use in molten metals. 4,964,736, Cl. 374-140.000.

Curran, Jon L.: *See*—
Allington, Robert W.; Curran, Jon L.; and Schmidt, Jerold B., 4,964,533, Cl. 222-14.000.

Curtis, James M.; and Sanders, Ronald S., to Dow Corning Wright Corp.; and Lumonics Material Processing Corporation. Method of laser machining molds with microtextured surfaces. 4,965,430, Cl. 219-121.690.

Curtiss, Harold H. Exercise device. 4,964,630, Cl. 272-93.000.

Curwen, Neil W. Dispensing apparatus. 4,964,535, Cl. 222-67.000.

Cussans, Nigel J., to Pfizer Inc. Tetrahydroisoquinoline compounds. 4,965,360, Cl. 546-145.000.

Custom Chrome, Inc.: *See*—
Hoeptner, Herbert W., 4,964,709, Cl. 350-546.000.

Custom Industries, Inc.: *See*—
Pugh, J. Robert; and Matherly, James F., 4,964,566, Cl. 236-49.300.

Cutts, Richard W., Jr.; Mehta, Nikhil A.; and Jewett, Douglas E., to Tandem Computers Incorporated. Multiple processor system having shared memory with private-write capability. 4,965,717, Cl. 364-200.000.

Cuykendall, Robert R.; and Strobl, Karlheinz, to University of Iowa Research Foundation. Saturated optical interaction gate. 4,965,760, Cl. 364-713.000.

Cycle Products Company: *See*—
O'Donovan, Robert; and Ippolito, Robert, 4,964,551, Cl. 224-32.00A.

Cyclops Corporation: *See*—
Kennedy, Charles G.; McKeown, Patrick D.; and Neiger, Jack W., 4,964,618, Cl. 256-24.000.

Cypress Semiconductor Corp.: *See*—
Anderson, Robert E., 4,965,472, Cl. 307-465.000.

Cyprus Mines Corporation: *See*—
Lamar, Richard S.; Pratt, William E.; Weber, Kenneth E.; and Roeder, Robert E., 4,964,955, Cl. 162-164.600.

Czeschka, Franz: *See*—
Lappohn, Jurgen; and Czeschka, Franz, 4,964,690, Cl. 350-96.210.

D.E.M. Controls of Canada: *See*—
D'Amato, Mark, 4,964,365, Cl. 118-419.000.

Daher, Lawrence J.: *See*—
Alexander, Thomas A.; Daher, Lawrence J.; Hancock, Clarence L.; and Peterson, Donald L., 4,965,072, Cl. 424-458.000.

Dahn, Jeffrey R.; Van Buuren, Tony; and Vonsacken, Ulrich, to Moli Energy Limited. Preparation of $VO_2(B)$ and a non-aqueous secondary cell using $VO_2(B)$ cathode. 4,965,150, Cl. 429-194.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Imoto, Kazunobu, 4,965,240, Cl. 503-227.000.
Kodera, Tokio; and Kazahaya, Nobuaki, 4,965,118, Cl. 428-137.000.
Mizobuchi, Akira; Hida, Yoshiaki; Umise, Shigeki; Yamamoto, Kyoichi; and Takahashi, Kyohei, 4,965,132, Cl. 428-411.100.

Daido Metal Company: *See*—
Ichikawa, Minoru; Kashiyama, Kotaro; and Furukawa, Tomomitsu, 4,964,420, Cl. 137-171.000.

Daigle, Robert V. Constant pressure nozzle system. 4,964,574, Cl. 239-589.000.

Daiichi Pharmaceutical Co., Ltd.: *See*—
Kametaka, Shigeru; Miyazaki, Tadaaki; Hayashi, Shinichi; Handa, Akira; and Kameda, Kinya, 4,965,262, Cl. 514-230.200.

Daiki Engineering Co., Ltd.: *See*—
Hashimoto, Koji; Kumagai, Naokazu; Asami, Katsuhiko; and Kawashima, Asahi, 4,964,967, Cl. 204-292.000.

Daimler-Benz Aktiengesellschaft: *See*—
Huttenberger, Michael; Kleineberg, Wolfgang; Schaal, Hans; Attinger, Thomas; and Dietz, Jurgen, 4,965,555, Cl. 340-624.000.
Resch, Reinhard, 4,964,676, Cl. 303-52.000.

Dainippon Ink and Chemicals, Inc.: *See*—
Tanaka, Yasuyuki; Takeuchi, Kiyofumi; and Tamura, Yuji, 4,964,616, Cl. 252-299.630.

Dainippon Pharmaceutical Co., Ltd.: *See*—
Uno, Hitoshi; Kon, Tatsuya; Nishikawa, Yoshinori; Shindo, Tokuhiko; Nakamura, Hideo; and Ishii, Katsumi, 4,965,266, Cl. 514-253.000.

Daio, Fumio; Niwa, Yukimasa; and Yoshida, Kenji, to Matsushita Electric Industrial Co., Ltd. Packed batteries and method of making the same. 4,965,148, Cl. 429-159.000.

Dale, James L.: *See*—
Burkhead, Wayne Z.; Dale, James L.; and Burkinshaw, Brian D., 4,964,865, Cl. 623-19.000.

Dallas Semiconductor Corporation: *See*—
Smith, Michael D., 4,965,794, Cl. 370-105.100.

Dall'Asta, Leone: *See*—
Ratti, Luigi; and Dall'Asta, Leone, 4,965,355, Cl. 540-226.000.

D'Amato, Mark, to D.E.M. Controls of Canada. Immersion process machine. 4,964,365, Cl. 118-419.000.

Dammel, Ralph: *See*—
Vicari, Richard; Aslam, Mohammad; Ray, Wilson B.; Davenport, Kenneth G.; Dammel, Ralph; Lingnau, Juergen; and Doessel, Karl-Friedrich, 4,965,400, Cl. 560-130.000.

Danho, Waleed: *See*—
Felix, Arthur M.; Fournier, Alain; and Danho, Waleed, 4,965,343, Cl. 530-334.000.

Daniel, Arthur A.; and Moore, Robert E., to International Business Machines Corporation. Method and apparatus for communication network alert message construction. 4,965,772, Cl. 364-900.000.

Daniel, Gary R., to Reynolds Metals Company. Blade setting tool assembly for a blade seal bar and method of using. 4,964,207, Cl. 29-468.000.

Daniels, Larry: *See*—
Andre, James R.; and Daniels, Larry, 4,964,440, Cl. 138-122.000.

Daniels, Mark H.; Funk, Jack; Evans, Wyendell B.; and Varner, Christopher C., to Space Services, Incorporated. Overlapping stage burn for multistage launch vehicles. 4,964,340, Cl. 102-377.000.

Daniels, Philim B.: *See*—
Young, Donald C.; and Daniels, Philim B., 4,965,415, Cl. 200-83.00N.

D'Antonio, Peter; and Konnert, John H., to RPG Diffusor Systems, Inc. Cinder block modular diffusor. 4,964,486, Cl. 181-285.000.

Darling, John E. Moisture presence alarm system. 4,965,554, Cl. 340-604.000.

Data General Corporation: *See*—
Almond, Gary R.; and Storey, David W., 4,965,787, Cl. 370-58.100.
Mostafa, Asghar D.; and Berry, Kirk H., 4,965,798, Cl. 370-079.000.

Datatape Incorporated: *See*—
Sarkisian, Nancy L.; and Martin, Stanley W., 4,964,557, Cl. 226-18.000.

Date, Shinji: *See*—
Yuyama, Masahiro; Koyama, Teruhisa; Matsurra, Hideaki; and Date, Shinji, 4,965,321, Cl. 525-329.700.

Datta, Rabinder S. Method and apparatus for mineral matter separation. 4,964,576, Cl. 241-19.000.

Davenport, Kenneth G.: *See—*
Vicari, Richard; Aslam, Mohammad; Ray, Wilson B.; Davenport, Kenneth G.; Dammel, Ralph; Lingnau, Juergen; and Doessel, Karl-Friedrich, 4,965,400, Cl. 560-130.000.

Davey, Brian I. Fishing aid. 4,964,234, Cl. 43-44.200.

David, Claire; and Seon, Francoise, to Rhone-Poulenc Chimie. Process for producing morphologically improved ceric oxide particulates. 4,965,057, Cl. 423-263.000.

Davidson Textron Inc.: *See—*
Parker, Kent L., 4,964,653, Cl. 280-732.000.

Davis, Alan R., to Eaton Corporation. Two-speed gear train assembly. 4,964,313, Cl. 74-331.000.

Davis, Glenn R.: *See—*
Wong, Kwok-Ping; and Davis, Glenn R., 4,964,610, Cl. 251-1.300.

Davis, Steven S., to Baker Hughes Incorporated. Membrane filter plate. 4,964,986, Cl. 210-231.000.

Deal, Samuel B.; and Bartch, Donald W., to RCA Licensing Corp. Method for preparing improved lithium-silicate glare-reducing coating for a cathode-ray tube. 4,965,096, Cl. 427-165.000.

Dean, Robert J., to Swiss Aluminum Ltd. Process and device for regulating the flatness of a cold rolled metal strip. 4,964,289, Cl. 72-13.000.

DeBar, David E.; and Shah, Indravadan J., to International Business Machines Corporation. Transient current peak detector. 4,965,512, Cl. 324-103.00P.

DeBoer, Charles D.; and Klingbiel, Richard T., to Eastman Kodak Company. Method of making color filter array for liquid crystal display. 4,965,242, Cl. 503-227.000.

de Boer, Jan: *See—*
Tabankia, Farshid M. H.; and de Boer, Jan, 4,965,338, Cl. 528-272.000.

Debouzie, Alain; Bouquet, Francois; and De Meringo, Alain, to Isover Saint-Gobain. Forming of felts which have an isotropic structure. 4,964,978, Cl. 264-119.000.

DeChristopher, Eugene L. Folded and assembled mosaic block. 4,965,106, Cl. 428-34.200.

DeCrane, Charles E. Pallet dispensing machine with latch mechanism. 4,964,782, Cl. 414-798.100.

Deelstra, Elaine A.: *See—*
Sullivan, Marian D.; and Deelstra, Elaine A., 4,964,796, Cl. 431-289.000.

Degnan, Donald E. Viewing device. 4,964,711, Cl. 350-574.000.

Degussa Aktiengesellschaft: *See—*
Helmling, Oswald; Arnold, G.; Rzehak, H.; Fahey, George C., Jr.; Berger, Larry L.; Merchen, Neaf R.; Medina, John; and Moerck, Rudi, 4,965,086, Cl. 426-636.000.

Dehio, Gottfried: *See—*
Burgdorf, Jochen; Reinartz, Hans-Dieter; Steffes, Helmut; Von Hayn, Holger; Volz, Peter; Wupper, Hans; Buschmann, Gunther; Beck, Erhard; Dehio, Gottfried; Dinkel, Dieter; and Rausch, Juergen, 4,964,681, Cl. 303-116.000.

Dehnert, Johannes; Lamm, Gunther; and Loeffler, Hermann, to BASF Aktiengesellschaft. Heterocyclic azo dyes containing cyanothiophese derivatives as diazo components and diaminopyridines as coupling components. 4,965,346, Cl. 534-766.000.

Deitz, Rosemary. Container for storing and dispensing semi-soft stick-like food products. 4,964,745, Cl. 401-131.000.

Dekker, Nicolaas M. J.: *See—*
Edwards, John W.; and Dekker, Nicolaas M. J., 4,965,832, Cl. 381-71.000.

Del Mar Avionics: *See—*
Gregg, David P., 4,964,934, Cl. 156-219.000.

DelBiondo, Thomas, II; and Tirado, Luis A., Jr. Hand-near-mouth warning device. 4,965,553, Cl. 340-573.000.

del Campo, Anthony A.: *See—*
Piunno, Carmen; Livesey, Stephen; Linner, John G.; del Campo, Anthony A.; and Zaltzberg, Mark J., 4,964,280, Cl. 62-78.000.

Delco Electronics Corporation: *See—*
Gallagher, Brian J.; Schaefer, Wayne A.; and Klein, Peter P., 4,965,573, Cl. 340-968.000.

Delgado de Molina Gonzalez, Maria J.: *See—*
Sanfeliu, Amparo S.; Tuero, Lucia S.; Delgado de Molina Gonzalez, Maria J.; and Vinas, Antonio B., 4,965,365, Cl. 548-109.000.

della Valle, Francesco; and Romeo, Aurelio, to Fidia S.p.A. Polysaccharide esters and their salts. 4,965,353, Cl. 536-55.100.

Dell'Orto: *See—*
Timoni, Gian Maria; Rossi, Giuseppina; and Dell'Orto, 4,965,777, Cl. 367-140.000.

Dell'Orto, Gianni. Modular element door mat. 4,964,187, Cl. 15-161.000.

Delwiche, James A.: *See—*
Abt, John; and Delwiche, James A., 4,965,668, Cl. 358-160.000.

De Maat, H. Thomas; and Schoeppe, H. Jay, II, to Silent Sound Systems, Inc. Front-mount grid frame. 4,964,231, Cl. 40-152.000.

De Meringo, Alain: *See—*
Debouzie, Alain; Bouquet, Francois; and De Meringo, Alain, 4,964,978, Cl. 264-119.000.

Demura, Takayuki: *See—*
Sawada, Hiroshi; Ueda, Tatehito; Nakanishi, Kiyoshi; and Demura, Takayuki, 4,964,271, Cl. 60-274.000.

Den-Mat Corporation: *See—*
Ibsen, Robert L.; and Glace, William R., 4,964,911, Cl. 106-35.000.

Denda, Akira, to NEC Corporation. Monostable multivibrator capable of generating a predetermined width of pulse without using a delay circuit. 4,965,465, Cl. 307-273.000.

Deniega, Jess; Vincze, Bela; and Pedlick, Jack, to Ethicon, Inc. Pneumatic surgical stapler connectors. 4,964,559, Cl. 227-178.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Maeda, Tetsuro; and Okamoto, Akihiro, 4,965,315, Cl. 525-86.000.

Dennis, Nicholas; and Burrell, Donald C., to Dow Chemical Company, The. Alditol ester derivatives of triclopyr, their preparation and herbicidal use thereof. 4,964,897, Cl. 71-94.000.

Dennis, Nicholas; and Burrell, Donald C., to Dow Chemical Company, The. Alditol ester derivative of trichloropyridine and herbicidal use thereof. 4,964,904, Cl. 71-94.000.

Dennison, Charles H.; and Gonzalez, Fernando, to Micron Technology, Inc. Spacer isolation method for minimizing parasitic sidewall capacitance and creating fully recessed field oxide regions. 4,965,221, Cl. 437-70.000.

DeProspero, David A.: *See—*
Chapman, Dwight E.; and DeProspero, David A., 4,965,408, Cl. 174-35.0MS.

Derossis, Antoine: *See—*
Le Mehaute, Alain; Quiniou, Jean-Francois; Roques-Carmes, Claude; Wehbi, Dalloul; and Derossis, Antoine, 4,965,746, Cl. 364-518.000.

Deroux-Dauphin, Patrice; Sibuet, Henri; and Dupeux, Thierry, to Commissariat a l'Energie Atomique; and Compagnie Europeenne de Composants Electroniques LCC. Process for producing electrical connections through a substrate. 4,964,212, Cl. 29-852.000.

Descamps, Marcel; and Sayac, Georges, to Sanofi. Process for the preparation of 2-propyl-2-pentenoic acid and its esters. 4,965,401, Cl. 560-210.000.

Desilets, Brian H.; Hsieh, Chang-Ming; and Hsu, Louis L., to International Business Machines Corporation. Method of making a lateral transistor. 4,965,217, Cl. 437-32.000.

Deutsch, Reinhard: *See—*
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Devaney, Mark J., Jr.; and Wannenwetsch, Edward H., to Eastman Kodak Company. Method and apparatus for transporting and liquid treating indeterminate lengths of web material. 4,965,618, Cl. 354-317.000.

De With, Gijsbertus; and Severin, Jan W., to U.S. Philips Corporation. Method of manufacturing a superconducting wire. 4,965,249, Cl. 505-1.000.

Dexter, Fred F., Jr. Mass transit system. 4,964,496, Cl. 198-324.000.

Dhein, Rolf: *See—*
Reuter, Knud; Freitag, Dieter; Weymans, Gunther; Dhein, Rolf; Meier, Erich; and Muller, Gerold, 4,964,890, Cl. 55-158.000.

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Dielhof, Pieter B., to U.S. Philips Corp. Picture pick-up device including a solid-state sensor and an electronic shutter operating with a minimum and maximum number of reset pulses. 4,965,671, Cl. 358-213.130.

Diesel Kiki Co., Ltd.: *See—*
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Dietz, Jurgen: *See—*
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Differential Steel Car Company: *See—*
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Digital Equipment Corporation: *See—*
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Hutchison, Jerry; Yang, Henry; and Hawe, William, 4,965,791, Cl. 370-94.100.
Kirby, Alan, 4,965,883, Cl. 371-52.000.
Kirk, John; and Narhi, Larry, 4,965,723, Cl. 364-200.000.
Lee, Neville K. S.; and Howard, James, 4,965,780, Cl. 369-13.000.
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Dilella, Anthony G.: *See—*
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Dilley, James E., to Northern Telecom Limited. Linear feedback shift registers for data scrambling. 4,965,881, Cl. 380-50.000.

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Dinkel, Dieter: *See—*
Burgdorf, Jochen; Reinartz, Hans-Dieter; Steffes, Helmut; Von Hayn, Holger; Volz, Peter; Wupper, Hans; Buschmann, Gunther; Beck, Erhard; Dehio, Gottfried; Dinkel, Dieter; and Rausch, Juergen, 4,964,681, Cl. 303-116.000.

Dinkelmann, Friedrich h, to Zinser Textilmaschinen GmbH. Apparatus for transporting spinning tubes to and from a textile spinning machine. 4,964,269, Cl. 57-281.000.

Dinsmore, Daniel, Jr.: *See—*
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DiPrima, Donna A.: *See—*
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DiSiena, James P.: *See—*
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Diversified Metal Incorporated: *See—*
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Diwisch, Thomas: *See—*
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Dr. Ing.h.c.F. Porsche AG: *See—*
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Dr. Willmar Schwabe GmbH & Co.: *See—*
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Docu-Vision, Inc.: *See—*
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Dogliani, Earico, to Industrie Pinifarina S.p.A. Flexible hood for a convertible motor vehicle, provided with elements for covering recesses in the lid of the compartment into which the hood is folded. 4,964,670, Cl. 296-136.000.

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DOM-Sicherheitstechnik GmbH & Co. KG: *See—*
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Dombrowski, James H.; Mummery, Herbert L.; Buecher, Roger W.; and Yumori, Isao R., to United States of America, Navy. System for limiting snap load intensity. 4,964,491, Cl. 188-299.000.

Dominguez, Gilbert. Applicator for motor vehicle glass adhesives and sealants. 4,964,362, Cl. 118-315.000.

Donahue, Raymond J.; Hsterberg, William G.; and Cleary, Terrance M., to Brunswick Corporation. Method and apparatus for producing titanium. 4,964,973, Cl. 204-64.00T.

Donikian, Roupen R.: *See—*
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Dennis, Nicholas; and Burrell, Donald C., 4,964,904, Cl. 71-94.000.
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Dow Corning Wright Corp.: *See—*
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Du Pont-Mitsui Polychemicals Co., Ltd.: *See—*
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Dubach, Werner F., to Alfatechnic AG. Plastic cap assembly having a central sealing pin. 4,964,537, Cl. 222-83.000.

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Dugger, Robert W., to Pfizer Inc. Process and intermediates for isopropyl 3S-amino-2R-hydroxy-alkanoates. 4,965,372, Cl. 549-253.000.

Duke, Ronald J.; Lu, Sun; McLaughlin, James R.; and Walowit, Eric, to Mead Corporation, The. Method and apparatus for halftone imaging. 4,965,672, Cl. 358-298.000.

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Duspiva, Walter S.; Gillett, John B.; and Spreen, James H., to International Business Machines Corporation. Transformer having plural-turn core. 4,965,712, Cl. 363-126.000.

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E.C.H. Will GmbH: *See—*
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Henzel, Richard P., 4,965,239, Cl. 503-227.000.
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Ingram, Gaylynn F.; and Hutchison, Evan W., 4,964,513, Cl. 206-459.000.
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Robison, Gary L., 4,965,627, Cl. 355-40.000.
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Edwards, Paul O.; Bolton, William E.; Hunter, Larry C.; and Horner, Amos A., to Applied Theory, Division of U.S.N.R., Inc. Veneer lathe charging method for determining log spin axis. 4,965,734, Cl. 364-474.090.
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Ejiri, Koichi; Jeng, Tina; Roth, Rithy; and Lam, Lak M., to Ricoh Corporation and Ricoh Company, Ltd. Facsimile remote diagnostic system. 4,965,676, Cl. 358-406.000.
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Johansson, Hans, 4,964,954, Cl. 162-164.600.
Elco Corporation: *See—*
Brannen, William T.; Burt, Gerald D.; and McDonald, Randolph A., 4,965,002, Cl. 252-32.500.
Electro-Nite Co.: *See—*
Cure, Omer; and Bollen, Theo P. C., 4,964,736, Cl. 374-140.000.
Electromedics, Inc.: *See—*
Reeder, Gary D.; and Janicki, Michael J., 4,964,984, Cl. 210-188.000.
Electrosource, Inc.: *See—*
Morris, Chris, 4,964,878, Cl. 29-623.100.
Eli Lilly and Company: *See—*
Chou, Ta-Sen; Heath, Perry C.; and Patterson, Lawrence E., 4,965,374, Cl. 549-313.000.
Elieli, Boaz. Electro acoustic transducer and loudspeaker. 4,965,839, Cl. 381-195.000.
Eljay Well Services Limited: *See—*
Armell, Richard A.; and Coull, David, 4,964,460, Cl. 166-113.000.
Elkins, William P.: *See—*
Ulich, Bobby L.; Calmes, Lonnie K.; and Elkins, William P., 4,964,721, Cl. 356-5.000.

Elko, Gary W.; Kubli, Robert A.; McAteer, Jeffrey P.; and West, James E., to AT&T Bell Laboratories. Image derived directional microphones. 4,965,775, Cl. 367-119.000.
Ellingboe, Jay M.: *See*—
Hoschette, Arnold; Ellingboe, Jay M.; and Lubke, Allen, 4,965,453, Cl. 250-349.000.
Elliott, Scott S.; Bray, Robert C.; Bagwell, Timothy L.; and Cross, Peter S., to Hewlett-Packard Company. Surface transverse wave resonator. 4,965,479, Cl. 310-313.00D.
Ellison, James F.: *See*—
Taft, Jeffrey D.; and Ellison, James F., 4,965,499, Cl. 318-568.110.
Elmenhorst, Joe H. Dry soil spreader for disk furrow opener. 4,964,351, Cl. 111-140.000.
Emhart Industries, Inc.: *See*—
Baker, Russ J.; Hansen, Robert A.; Scott, Paul F.; and Vozenilek, Edward F., 4,965,523, Cl. 324-672.000.
Cole, Ronald E., 4,965,859, Cl. 200-38.00R.
Richmond, James W., 4,964,359, Cl. 116-28.100.
Emi, Makoto: *See*—
Seita, Yukio; and Emi, Makoto, 4,964,991, Cl. 210-500.360.
Emi, Shigenori: *See*—
Yamamoto, Kazumi; Kikuchi, Toshiro; and Emi, Shigenori, 4,965,194, Cl. 435-25.000.
Empi, Inc.: *See*—
Johnson, Michael T.; and Kipnis, Alexander, 4,964,411, Cl. 128-733.000.
Endo, Kazuhito, to NEC Corporation. Uplink cross-polarization interference canceller using correlation calculator and stepwise tracking controller. 4,965,809, Cl. 375-38.000.
Endoh, Kenjiro, to Kabushiki Kaisha Toshiba. Apparatus for releasing a restriction on the recording of an information signal on a recording medium. 4,965,680, Cl. 360-60.000.
Energy Technology, Inc.: *See*—
Boldwyn, Scott L., 4,965,492, Cl. 315-156.000.
Energy Transportation Group, Inc.: *See*—
Tornay, Edmund G., 4,964,437, Cl. 137-1.000.
Engelhard Corporation: *See*—
Speronello, Barry K., 4,965,233, Cl. 502-65.000.
Yamada, Teiji; and Funabiki, Masaki, 4,965,243, Cl. 502-304.000.
Engineering & Precision Machining, Inc.: *See*—
Lee, Harry E., Jr., 4,964,320, Cl. 82-1.110.
Engstrom, Ulf; and Mustoesen, Olavi, to Hoganas AB. Heat-insulating component and a method of making same. 4,964,909, Cl. 75-246.000.
Entwicklungszentrum fur Zerspanungstechnik GmbH & Co. KG: *See*—
Kieninger, Walter, 4,964,763, Cl. 407-40.000.
Epperson, David L., to John Fluke Mfg. Co., Inc. Particulate spacers for touch sensitive overlay panel applications. 4,965,421, Cl. 200-514.000.
Erb, David J.: *See*—
Giesbrecht, Wayne E.; Phillips, Howard C.; and Erb, David J., 4,964,200, Cl. 29-33.00M.
Erdelmeier, Irene: *See*—
Gais, Hans-Joachim; Erdelmeier, Irene; and Birk, Rolf, 4,964,846, Cl. 549-336.000.
Ergott, Harold L., Jr.; Bruder, John F.; Peters, Robert E.; and Rainwater, Sam L., to Quadri Corporation. Non-volatile semiconductor memory with SCRAM hold cycle prior to SCRAM-to-E^2PROM backup transfer. 4,965,828, Cl. 380-50.000.
Eriks Holding N.V.: *See*—
Kleynjans, Joseph P. H.; and Kalempa, Walenty, 4,964,777, Cl. 414-401.000.
Erlich, Henry A.: *See*—
Mullis, Kary B.; Erlich, Henry A.; Gelfand, David H.; Horn, Glenn; and Saiki, Randall K., 4,965,188, Cl. 435-6.000.
ERNI Elektroapparate GmbH: *See*—
Lappohn, Jurgen; and Czeschka, Franz, 4,964,690, Cl. 350-96.210.
Erweka Apparatebau GmbH: *See*—
Schneider, Ortwin, 4,964,310, Cl. 73-866.000.
Eryman, William S.: *See*—
Haddad, Muin S.; and Eryman, William S., 4,965,235, Cl. 502-209.000.
Es, Willy, to Plombelec. Fixing peg for use in friable materials. 4,964,772, Cl. 411-82.000.
Eskelinen, Juhani: *See*—
Karna, Anssi; Heikkinen, Jukka; and Eskelinen, Juhani, 4,964,364, Cl. 118-410.000.
Espinosa, Medardo: *See*—
Watts, Leonard A.; and Espinosa, Medardo, 4,964,627, Cl. 271-188.000.
Essex Group, Inc.: *See*—
Patel, Punam M.; and Kaemmer, Bruce G., 4,964,363, Cl. 118-405.000.
Essiz, Munir: *See*—
Weber, Abraham; Bouzard, Daniel; Essiz, Munir; Di Cesare, Pierre; Jacquet, Jean-Pierre; and Remuzon, Philippe, 4,965,273, Cl. 514-300.000.
Esterowitz, Leon; and Stoneman, Robert C., to United States of America, Navy. Room-temperature, laser diode-pumped, q-switched, 2 micron, thulium-doped, solid state laser. 4,965,803, Cl. 372-5.000.
Esteve Bianchini, Asuncion: *See*—
Cabre Castellvi, Juan; Diago Meseguer, Jose ; Esteve Bianchini, Asuncion; Lenhardt Padro, Carlos E.; and Sans Pitarch, Esteve, 4,965,358, Cl. 544-357.000.
Etat Fracais: *See*—
Auvert, Geoffroy; Georgel, Jean-Claude; and Guerin, Yves, 4,964,940, Cl. 156-345.000.
Ethicon, Inc.: *See*—
Berry, John P., 4,965,110, Cl. 428-36.400.
Deniega, Jess; Vincze, Bela; and Pedlick, Jack, 4,964,559, Cl. 227-178.000.
Ethyl Corporation: *See*—
Schacht, Etienne; and Crommen, Jan, 4,965,397, Cl. 560-60.000.
Etoh, Jun; Itoh, Kiyoo; Aoki, Masakazu; and Hori, Ryoichi, to Hitachi, Ltd. Semiconductor memory capable of high-speed data erasing. 4,965,769, Cl. 365-218.000.
Europe Metalli - LMI S.p.A.: *See*—
Giarda, Andrea; and Ceresara, Sergio, 4,965,045, Cl. 420-478.000.
Eurosearch S.r.l.: *See*—
Furian, Diego, 4,965,382, Cl. 556-79.000.
Evans, Samuel: *See*—
Meier, Hans R.; and Evans, Samuel, 4,965,006, Cl. 252-50.000.
Evans, Wyendell B.: *See*—
Daniels, Mark H.; Funk, Jack; Evans, Wyendell B.; and Varner, Christopher C., 4,964,340, Cl. 102-377.000.
Eveready Battery Company, Inc.: *See*—
Smilanich, Nicholas J.; and Sphar, Robert A., 4,965,507, Cl. 320-48.000.
Evers, Wilhelm: *See*—
Poppe, Ulrich; Schubert, Jurgen; and Evers, Wilhelm, 4,965,248, Cl. 505-1.000.
Ewer, Peter R.: *See*—
Pelly, Brian R.; Dubhashi, Ajit; and Ewer, Peter R., 4,965,710, Cl. 363-56.000.
Excelermatic Inc.: *See*—
Kraus, Charles E., 4,964,312, Cl. 74-199.000.
Excello Specialty Company, The: *See*—
Jones, Wallace R.; Isaksen, Robert A.; and Krieger, Paul A., 4,965,113, Cl. 428-40.000.
Exclusive Design Company: *See*—
Rubie, Frank D.; Stearman, Roger R.; and Smith, Robert A., 4,964,242, Cl. 51-144.000.
Exxel Container, Inc.: *See*—
Katz, Hyman, 4,964,540, Cl. 222-95.000.
Exxon Chemicals Patents Inc: *See*—
Williams, Dennis A.; Newlove, John C.; and Horton, Roger L., 4,964,466, Cl. 166-300.000.
Exxon Research and Engineering Co.: *See*—
Brois, Stanley J.; and Gutierrez, Antonio, 4,965,375, Cl. 549-320.000.
Kerby, Michael C.; and Eichhorn, Bryan W., 4,965,381, Cl. 556-18.000.
Schilowitz, Alan M.; Shaub, Harold; Berlowitz, Paul J.; Homan, Howard S.; and Wigg, Eric E., 4,964,880, Cl. 44-341.000.
Vaughan, David E. W., 4,965,059, Cl. 423-328.000.
Eyzon Corporation: *See*—
Bozzo, Suzanna D.; and Thomas, Ronald W., 4,965,673, Cl. 358-335.000.
F. E. Schulte Strathaus KG: *See*—
Kruger, Manfred; and Schulte Strathaus, Franz-Erich, 4,964,943, Cl. 156-498.000.
Fabry, Ehrenfried; Goddard, George; and Meyer, Dieter, to Robert Bosch GmbH. Display apparatus with liquid crystal cells, preferably for motor vehicles. 4,965,564, Cl. 340-784.000.
Fadden, Richard G., Jr.: *See*—
Economy, Richard; Steiner, Walter R.; and Fadden, Richard G., Jr., 4,965,745, Cl. 364-518.000.
Fahey, George C., Jr.: *See*—
Helmling, Oswald; Arnold, G.; Rzehak, H.; Fahey, George C., Jr.; Berger, Larry L.; Merchen, Neal R.; Medina, John; and Moerck, Rudi, 4,965,086, Cl. 426-636.000.
Faimali, Maria. Automatic curative hydromassage apparatus. 4,964,399, Cl. 128-66.000.
Falk, R. Aaron, to Boeing Company, The. Optical latch and method of latching data using same. 4,964,687, Cl. 350-96.130.
Fantoni, Giuseppe; and Temporin, Daniele, to Officine Meccaniche G. Cerutti S.p.A. Method of mechanically joining the marginal portions of a blank of a printing plate for rotary printing, and printing plate thus produced. 4,964,338, Cl. 101-378.000.
Fanuc Ltd.: *See*—
Mizuno, Toru; Hara, Ryuichi; and Nishi, Hiroji, 4,965,500, Cl. 318-568.130.
Fanuc Ltd: *See*—
Iwagaya, Takashi, 4,965,737, Cl. 364-474.220.
Farineau, Jacques, to Aerospatiale Societe Nationale Industrielle. System for controlling roll and yaw of an aircraft. 4,964,599, Cl. 244-195.000.
Farmitalia Carlo Erba S.R.L.: *See*—
Caruso, Michele; Suarato, Antonino; Angelucci, Francesco; and Arcamone, Federico, 4,965,351, Cl. 536-6.400.
Farnbach, William A. Digital signal fault detector. 4,965,800, Cl. 371-22.100.
Farrell, Eugene A.; and Robinson, Mark D., to Carthage Machine Company. Flat disk flaker. 4,964,447, Cl. 144-176.000.
Fawzi, Mahdi B.: *See*—
Silbering, Steven B.; Blythe, Rowland P., Jr.; Nesbitt, Russell U., Jr.; and Fawzi, Mahdi B., 4,965,203, Cl. 435-188.000.
Fayfield, Robert W., to Banner Engineering Corp. Level indicator with alarm. 4,965,548, Cl. 340-511.000.
Feider, David F.: *See*—
Hanke, Kurt F.; Lund, Wesley C.; and Feider, David F., 4,965,433, Cl. 219-230.000.

Feijen, Jan: *See*—
Greidanus, Pieter J.; Feijen, Jan; Eenink, Marinus J. D.; Rieke, Johannes C.; Olijslager, Jan; and Albers, Jan H. M., 4,965,128, Cl. 428-398.000.
Fein, Michael E., to Tencor Instruments. Vapor discharge lamp with gradient temperature control. 4,965,484, Cl. 313-15.000.
Fekete, Marton: *See*—
Rozsa, Laszlo; Petocz, Lujza; Szirt nee Kiszelly, Eniko; Fekete, Marton; Szecsey nee Hegedus, Maria; Gigler, Gabor; and Gacsalyi, Istvan, 4,965,259, Cl. 514-183.000.
Feldman, Ruth L. Diaper with integral changing pad and disposal container. 4,964,859, Cl. 604-385.100.
Felix, Arthur M.; Fournier, Alain; and Danho, Waleed, to Hoffmann-La Roche Inc. Method of peptide synthesis. 4,965,343, Cl. 530-334.000.
Fenk, Josef: *See*—
Kriedt, Hans; Dietze, Andreas; and Fenk, Josef, 4,965,510, Cl. 323-315.000.
Ferco International Usine de Ferrures de Batiment: *See*—
Prevot, M. Gerard; Aumercier, M. Laurent; and Simoncelli, M. Philippe, 4,964,660, Cl. 292-37.000.
Ferenczi, Laurent: *See*—
Brugerolle, Jean-Renaud; and Ferenczi, Laurent, 4,964,886, Cl. 55-16.000.
Ferg, Nelson M.: *See*—
Braine, Mark D.; Kirby, Ralph; Schultz, Donald W.; Tuttle, Richard G.; Ferg, Nelson M.; Hickman, John B.; and Webb, William C., 4,964,248, Cl. 52-60.000.
Ferguson, Gregory A., to Precision Handling Devices, Inc. Forms feed tractor with lid which facilitates forms alignment. 4,964,556, Cl. 226-74.000.
Ferrando, William: *See*—
Kabacoff, Lawrence T.; and Ferrando, William, 4,965,139, Cl. 428-682.000.
Ferro, Gregory A., to Imi-Tech Corporation. Method of making foam-filled cellular structures. 4,964,936, Cl. 156-242.000.
Fiat Auto S.p.A.: *See*—
Maggioni, Virginio; and Torrielli, Vittorino, 4,964,612, Cl. 251-129.090.
Fidia S.p.A.: *See*—
della Valle, Francesco; and Romeo, Aurelio, 4,965,353, Cl. 536-55.100.
Fiechtner, Heinz: *See*—
Lutz, Rolf; Reinalter, Franz; and Fiechtner, Heinz, 4,964,505, Cl. 192-53.00F.
Fiedler, Lawrence D.: *See*—
Basey, Ronald H.; Bilgrien, Carl J.; Fiedler, Lawrence D.; and Lee, Chi-long, 4,965,367, Cl. 548-110.000.
Fiedler, Volker-Bernd: *See*—
Boshagen, Horst; Rosentreter, Ulrich; Lieb, Folker; Oediger, Hermann; Seuter, Friedel; Perzborn, Elisabeth; and Fiedler, Volker-Bernd, 4,965,258, Cl. 514-158.000.
Fields, Donald L., Jr.; Miller, William H.; and Pulwer, Mitchell J., to Monsanto Company. Oxidation/dealkylation process. 4,965,403, Cl. 562-17.000.
Fiene, Dale: *See*—
Brodecki, James; Tanguay, William; and Fiene, Dale, 4,965,556, Cl. 340-628.000.
Fife, James A. Method for controlling the oxygen content of tantalum material. 4,964,906, Cl. 75-369.000.
Filardo, Giuseppe: *See*—
Chum, Helena L.; and Filardo, Giuseppe, 4,964,995, Cl. 210-634.000.
FilmTec Corporation: *See*—
Cadotte, John E.; Racchini, Joel-Raphael; and Petersen, Robert J., 4,964,998, Cl. 210-654.000.
Filthuth, Heinz A. A. W. Two-dimensional proportional counter for position sensitive measurement of ionizing radiation. 4,965,861, Cl. 250-385.100.
First Brands Corporation: *See*—
Biel, Edward N.; and Tucker, Edward B., 4,965,108, Cl. 428-35.700.
Mohr, Paul H.; and Pepe, Enrico J., 4,965,334, Cl. 528-34.000.
Tucker, Edward B.; and Biel, Edward N., 4,965,109, Cl. 428-35.700.
Firth, Ian M.: *See*—
McGregor, Thomas; Wemyss, George A.; and Firth, Ian M., 4,965,833, Cl. 381-83.000.
Fischer, Arthur, to fischerwerke Artur Fischer GmbH & Co KG. Drilling device for producing drill holes with undercut. 4,964,475, Cl. 175-210.000.
Fischer, Artur, to fischerwerke Artur Fischer GmbH & Co. KG. Drilling device for producing drill holes with an undercut. 4,964,476, Cl. 175-213.000.
Fischer, William C., Jr., to United Technologies Corporation. X-wing fly-by-wire vehicle management system. 4,965,879, Cl. 364-424.010.
fischerwerke Artur Fischer GmbH & Co KG: *See*—
Fischer, Arthur, 4,964,475, Cl. 175-210.000.
fischerwerke Artur Fischer GmbH & Co. KG: *See*—
Fischer, Artur, 4,964,476, Cl. 175-213.000.
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Gosselin, Robert G., 4,964,216, Cl. 30-254.000.
Fitch, Ernest C.: *See*—
Hong, Ing-Tsann; and Fitch, Ernest C., 4,965,713, Cl. 364-149.000.
Fitoussi, Richard: *See*—
Leveque, Alain; and Fitoussi, Richard, 4,964,996, Cl. 210-634.000.
Leveque, Alain; Fitoussi, Richard; and Sabot, Jean-Louis, 4,964,997, Cl. 210-634.000.
Fitzgerald, Gary C. Tennis racket. 4,964,635, Cl. 273-73.00C.
Fleming, Raymond T.: *See*—
Westlund, Arnold E., Jr.; Boyd, John M.; and Fleming, Raymond T., 4,964,829, Cl. 445-22.000.
Fling, Russell T.: *See*—
Canfield, Barth A.; and Fling, Russell T., 4,965,669, Cl. 358-171.000.
Flint, Ephraim B.; Grebe, Kurt R.; Gruber, Peter A.; and Zingher, Arthur R., to International Business Machines Corporation. Flexible finned heat exchanger. 4,964,458, Cl. 165-80.400.
Floren, Carl E.: *See*—
Sands, Robert E.; and Floren, Carl E., 4,964,614, Cl. 251-315.000.
Flores, Orlando: *See*—
Lillig, John E.; Whelan, Michael J.; Cheon, Thomas V.; Sisson, Patricia A.; and Flores, Orlando, 4,965,049, Cl. 422-68.100.
Florida Recoveries Partnership: *See*—
Berry, William W.; and Rossiter, Gordon J., 4,965,061, Cl. 423-484.000.
Flow Systems, Inc.: *See*—
Ehlbeck, Uwe, 4,964,244, Cl. 51-270.000.
Flowers, Richard W.; and Murray, John R., Jr., to Differential Steel Car Company. Drop end, open top rail car. 4,964,348, Cl. 105-406.200.
Floyd, David M.: *See*—
Misra, Raj N.; Floyd, David M.; and Hall, Steven E., 4,965,279, Cl. 514-381.000.
Flygare, Wayne A.: *See*—
Stadler, Jeffrey A.; and Flygare, Wayne A., 4,965,477, Cl. 310-114.000.
Flygt AB: *See*—
Lindroos, Helge, 4,965,409, Cl. 174-65.0SS.
Focke & Co. (GmbH & Co.): *See*—
Focke, Heinz; and Mutschall, Hugo, 4,964,260, Cl. 53-467.000.
Focke, Heinz; and Mutschall, Hugo, to Focke & Co. (GmbH & Co.). Packaging machine for cardboard boxes and process for packaging articles in cardboard boxes. 4,964,260, Cl. 53-467.000.
Fokker Special Products B.V.: *See*—
Guliker, Hendrik J., 4,964,252, Cl. 52-275.000.
Foldesy, Robin G.; and Wheeler, Robert G. Condom articles, and apparatus and method for making and using the same. 4,964,416, Cl. 128-842.000.
Foldi, Tivadar; Biro, Gabor; Barna, Tamas; Nagy, Imre; and Vincze, Laszlo . Lighting apparatus. 4,965,876, Cl. 362-247.000.
Fong, Ronald A.; and Kong, Stephen B., to Clorox Company, The. Bleaching with phenylene diester peracid precursors. 4,964,870, Cl. 8-111.000.
Fontecchio, Robert P.: *See*—
Bishop, Robert J.; Fontecchio, Robert P.; and Zelenak, Daniel G., Jr., 4,964,654, Cl. 280-743.000.
Ford Aerospace Corporation: *See*—
Zanio, Ken; and Bean, Ross C., 4,965,649, Cl. 357-30.000.
Ford Motor Company: *See*—
Schmatz, Duane J., 4,965,142, Cl. 429-11.000.
Ford New Holland, Inc.: *See*—
Cromheecke, Eric L. A.; and Strong, Russell W., 4,964,838, Cl. 460-66.000.
Forethought Life Insurance Company: *See*—
Prentice, John W., 4,964,656, Cl. 281-44.000.
Forsgren, Lyle M.: *See*—
Newman, Neil A.; Bankstahl, Herbert A.; Griffiths, John M.; Forsgren, Lyle M.; and Beck, Wayne T., 4,964,823, Cl. 440-61.000.
Forsythe, Donald L.: *See*—
Beam, Don E.; Wills, David C.; and Forsythe, Donald L., 4,964,606, Cl. 248-333.000.
Fortney, John D., to Brunswick Corporation. Aperture antenna having nonuniform resistivity. 4,965,869, Cl. 343-781.00R.
Fortney, Roger D. Bread cutting apparatus. 4,964,323, Cl. 83-167.000.
Fournier, Alain: *See*—
Felix, Arthur M.; Fournier, Alain; and Danho, Waleed, 4,965,343, Cl. 530-334.000.
Fowler, Darryle E.: *See*—
Ciminelli, Michael A.; Buck, Jack; Weaver, Charles G.; and Fowler, Darryle E., 4,964,753, Cl. 404-122.000.
Fox, Stephen P.: *See*—
Neal, Donald F.; Kearns, Michael W.; Fox, Stephen P.; Melville, James E.; Wright, Kenneth W.; Wood, Philip S.; Pinder, John T.; and Clark, Stephen C., 4,964,564, Cl. 228-107.000.
Fraise, Pierre: *See*—
Lenormand, Regis; Billand, Marcel; Fraise, Pierre; Goupil, Jean-Claude; Raguenet, Gerard; and Rene, Didier, 4,965,587, Cl. 342-372.000.
Fraley, Lowell D.: *See*—
Van Dijk, Christiaan P.; and Fraley, Lowell D., 4,965,062, Cl. 423-576.700.
Francois, Pierre; and Prodel, Michel H. M. F., to S.I.C.A.M.E. Societe Industrielle de Construction. Branch connection accessory device for an insulated branch cable to be connected to an insulated main cable. 4,964,813, Cl. 439-521.000.
Franz, Dieter: *See*—
Merger, Franz; Harder, Wolfgang; Hettinger, Peter; Priester, Claus-Ulrich; Franz, Dieter; and Voges, Dieter, 4,965,362, Cl. 546-246.000.
Fratello, Vincent J.; Rabinovich, Eliezer M.; and Shmulovich, Joseph, to AT&T Bell Laboratories. Sol gel method for forming thin luminescent films. 4,965,091, Cl. 427-64.000.

Fraunhofer-Gesellschaft zur Forderund der Forschung E. V.: *See*—
Goetzberger, Adolf, 4,964,713, Cl. 350-629.000.
Fredriksson, Borje; and Chamberlin, Jeffery L., to Beloit Corporation. Method of and means for hydrodynamic mixing. 4,964,733, Cl. 366-336.000.
Freeman, Guy R., to United Technologies Corporation. Schottky diode for integrated circuits. 4,965,643, Cl. 357-15.000.
Freeman, Kenneth G., to U.S. Philips Corporation. Flat cathode ray tube display apparatus. 4,965,487, Cl. 313-422.000.
Freeman, Norman H.: *See*—
Van Leeuwen, Hendrikus J.; Freeman, Norman H.; Sutherland, Brian J.; and Jameson, Graeme W., 4,965,078, Cl. 424-40.000.
Freepons, Donald E. Plant growth regulators derived from chitin. 4,964,894, Cl. 71-88.000.
Frei, Olaf; Frish, Max; Bodmer, Viktor; and Mizrah, Tiberiu, to Swiss Aluminium Ltd. Ceramic foam for filters for cleaning exhaust gases of diesel engines. 4,965,101, Cl. 427-255.000.
Freitag, Dieter: *See*—
Reuter, Knud; Freitag, Dieter; Weymans, Gunther; Dhein, Rolf; Meier, Erich; and Muller, Gerold, 4,964,890, Cl. 55-158.000.
Frey, Christian; Dill, Bernd; and Schmid, Konrad, to Ciba-Geigy Corporation. Blue anthraquinone disperse dyes and mixtures of blue disperse dyes. 4,964,876, Cl. 8-643.000.
Freytsis, Avrum; and Sedgewick, Judy E., to Varian Associates, Inc. Disk scanning apparatus for batch ion implanters. 4,965,862, Cl. 250-453.100.
Frezzolini Electronics Inc.: *See*—
Crawford, James J., 4,965,462, Cl. 307-66.000.
Friedmann, Oswald, to Luk Lamellen und Kupplungsbau GmbH. Multiple clutch assembly. 4,964,504, Cl. 192-48.400.
Frish, Max: *See*—
Frei, Olaf; Frish, Max; Bodmer, Viktor; and Mizrah, Tiberiu, 4,965,101, Cl. 427-255.000.
Fritzberg, Alan R.; Kasina, Sudhakar; Rao, Tripuraneni N.; Vander-Heyden, Jean-Luc; and Srinivasan, Ananthachari, to NeoRx Corporation. Chelating compounds for metal-radionuclide labeled proteins. 4,965,392, Cl. 558-254.000.
FSK Kabushiki Kaisha: *See*—
Ebe, Kazuyoshi; Narita, Hiroaki; Taguchi, Katsuhisa; Akeda, Yoshitaka; and Saito, Takanori, 4,965,127, Cl. 428-343.000.
Fuchs, Harold E., to AT&T Bell Laboratories. Electroless silver coating for dielectric filter. 4,965,094, Cl. 427-125.000.
Fuhrmann, Andreas. Film carrier for endodontic dental radiographs. 4,965,885, Cl. 378-168.000.
Fuji Machinery Company Ltd.: *See*—
Seko, Kiyoshi; Hatano, Masato; and Suzuki, Shigeki, 4,964,258, Cl. 53-75.000.
Fuji Oil Company Limited: *See*—
Akasaka, Takeshi; Ochi, Kumie; Onari, Kazuhiro; Katayama, Tsutomu; Furuta, Hitoshi; Nakae, Kazumi; and Fukuda, Satomi, 4,965,080, Cl. 426-104.000.
Fuji Photo Film Co., Ltd.: *See*—
Fujimoto, Hiroshi; and Yoshida, Kazuaki, 4,965,175, Cl. 430-375.000.
Hirano, Mitsunori; Hirano, Masato; Yagihara, Morio; and Okada, Hisashi, 4,965,169, Cl. 430-264.000.
Hosoi, Noriyuki; and Usami, Toshimasa, 4,965,166, Cl. 430-156.000.
Kubodera, Seiiti; Ikegawa, Akihiko; and Okazaki, Masaki, 4,965,181, Cl. 430-550.000.
Kuwashima, Shigeru; and Mitsui, Akio, 4,965,179, Cl. 430-504.000.
Masaki, Kouichi; Kosha, Hideaki; Miura, Toshihiko; and Tamai, Yasuo, 4,965,125, Cl. 428-329.000.
Mihara, Yuji, 4,965,182, Cl. 430-576.000.
Ogiwara, Nagao; and Nagumo, Akihiko, 4,965,623, Cl. 355-27.000.
Ono, Toshio; Ogawa, Hiroshi; Mizuno, Chiaki; and Saito, Shinji, 4,965,120, Cl. 428-213.000.
Ozawa, Yoshio, 4,965,631, Cl. 355-75.000.
Shiota, Kazuo, 4,965,662, Cl. 358-78.000.
Suzuki, Nobuo; Sakasai, Yutaka; and Usui, Tetuo, 4,965,163, Cl. 430-114.000.
Ukai, Toshinao; Shirasu, Kazuhiro; Nakamura, Koki; Koya, Keizo; Okada, Masahiro; and Katoh, Kazunobu, 4,965,170, Cl. 430-264.000.
Fuji Xerox Co., Ltd.: *See*—
Aonuma, Shigeo; and Oyamada, Koichi, 4,965,162, Cl. 430-110.000.
Fukuda, Yuzuru; and Nishikawa, Masayuki, 4,965,164, Cl. 430-128.000.
Karakida, Kenichi; Yagi, Shigeru; Fukuda, Yuzuru; Nishikawa, Masayuki; Roh, Te Nam; Takahashi, Noriyoshi; and Ono, Masato, 4,965,154, Cl. 430-58.000.
Nagatsuka, Ikutaroh; Matsumura, Yasuo; Takeda, Masayuki; Suzuki, Chiaki; and Aoki, Takayoshi, 4,965,160, Cl. 430-108.000.
Fujii, Hirokazu; and Yoshida, Fumio, to Nitta Industries Corporation. Crosspiece supporting pad in structural construction. 4,964,254, Cl. 52-396.000.
Fujii Photo Film Co., Ltd.: *See*—
Suematsu, Koichi; Yamada, Sumito; Yasuda, Tomokazu; Yamanouchi, Junichi; and Mukunoki, Yasuo, 4,965,180, Cl. 430-518.000.
Fujii, Yoshio, to Mazda Motor Corp. Dashboard support construction for cowl region of a motor car. 4,964,672, Cl. 296-192.000.
Fujikawa, Masazumi; and Haneda, Hideo, to Nitto Kasei Co., Ltd. Process for preparation of asymmetric triorganotin halide. 4,965,380, Cl. 556-12.000.
Fujikura Ltd.: *See*—
Oohashi, Keiji; Suzuki, Hideo; Araki, Shinji; and Shimomichi, Tsuyoshi, 4,964,694, Cl. 350-96.330.
Sugimoto, Masaru; Kohno, Osamu; Ikeno, Yoshimitsu; Sadakata, Nobuyuki; Nakagawa, Mikio; Aoki, Shin'ya; Tan, Masayuki; Okiai, Ryuichi; Yoshida, Syotaro; Hasegawa, Masakazu; and Yamanouchi, Hiroshi, 4,965,245, Cl. 505-1.000.
Fujimoto, Hiroshi; and Yoshida, Kazuaki, to Fuji Photo Film Co., Ltd. Method for processing a silver halide photosensitive material for color photography. 4,965,175, Cl. 430-375.000.
Fujimoto, Osamu: *See*—
Suzuki, Minoru; Minefuji, Nobutaka; and Fujimoto, Osamu, 4,964,696, Cl. 350-315.000.
Fujimura, Masaki: *See*—
Nakanishi, Tatsuo; Tadokoro, Toyohiko; and Fujimura, Masaki, 4,964,640, Cl. 273-167.00H.
Fujioka, Teruhiko, to Tenryu Technics Co., Ltd. Parts exchange mechanism of chip mounter. 4,964,208, Cl. 29-568.000.
Fujisawa Pharmaceutical Company, Ltd.: *See*—
Oku, Teruo; Kawai, Yoshio; Kayakiri, Hiroshi; Kuratani, Kazuyoshi; and Hashimoto, Masashi, 4,965,274, Cl. 514-311.000.
Fujita, Masami; Nakanishi, Kazuhiro; and Sameshima, Yoshinobu, to Konica Corporation. Variable focus camera. 4,965,615, Cl. 354-145.100.
Fujitsu Limited: *See*—
Hashimoto, Shuichi, 4,965,501, Cl. 318-595.000.
Naito, Takao; Chikama, Terumi; Watanabe, Shigeki; Kiyonaga, Tetsuya; Onoda, Yoshihito; Kuwahara, Hideo; Onaka, Hiroshi; and Miyata, Hideyuki, 4,965,858, Cl. 455-619.000.
Nishino, Tetsuo; Isono, Osamu; Tachibana, Tetsuo; Iwabuchi, Eisuke; and Fukui, Toshimasa, 4,965,790, Cl. 370-85.120.
Sasaki, Susumu, 4,965,852, Cl. 455-82.000.
Takeuchi, Atsushi, 4,965,768, Cl. 365-201.000.
Watarai, Shinichi; Inoue, Makoto; and Ohyabu, Keiji, 4,965,640, Cl. 355-283.000.
Yamane, Kazuo; and Shimasue, Masanori, 4,965,797, Cl. 370-112.000.
Fujiwara, Hideo, to Hitachi Maxell Ltd. Multihead magnetic disk device for a magnetic disk memory. 4,965,687, Cl. 360-103.000.
Fujiwara, Masanori: *See*—
Hotomi, Hideo; Masaki, Kenji; Iino, Shuji; Osawa, Izumi; Fujiwara, Masanori; and Doi, Isao, 4,965,156, Cl. 430-66.000.
Fukamachi, Masaaki: *See*—
Tanaka, Akira; Fukamachi, Masaaki; and Sakata, Kazuhiro, 4,965,460, Cl. 307-10.200.
Fukawa, Kiyotake: *See*—
Maruyama, Tsutomu; Fukawa, Kiyotake; Akiyama, Atsushi; and Kiyomura, Yoshihiro, 4,965,073, Cl. 430-292.000.
Fukazawa, Nobuyuki: *See*—
Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; and Nakano, Takuo, 4,965,263, Cl. 514-247.000.
Fukuda, Satomi: *See*—
Akasaka, Takeshi; Ochi, Kumie; Onari, Kazuhiro; Katayama, Tsutomu; Furuta, Hitoshi; Nakae, Kazumi; and Fukuda, Satomi, 4,965,080, Cl. 426-104.000.
Fukuda, Yuzuru; and Nishikawa, Masayuki, to Fuji Xerox Co., Ltd. Method for producing electrophotographic photoreceptor. 4,965,164, Cl. 430-128.000.
Fukuda, Yuzuru: *See*—
Karakida, Kenichi; Yagi, Shigeru; Fukuda, Yuzuru; Nishikawa, Masayuki; Roh, Te Nam; Takahashi, Noriyoshi; and Ono, Masato, 4,965,154, Cl. 430-58.000.
Fukui, Toshimasa: *See*—
Nishino, Tetsuo; Isono, Osamu; Tachibana, Tetsuo; Iwabuchi, Eisuke; and Fukui, Toshimasa, 4,965,790, Cl. 370-85.120.
Fukushima, Atsuhiko; Kashiwazaki, Takashi; Hosoi, Masayuki; and Ando, Hitoshi, to Pioneer Electronic Corporation. Variable-brightness display for use in a navigation system for a vehicle. 4,965,574, Cl. 340-995.000.
Fukushima, Fumio: *See*—
Oki, Takehiko; Fukushima, Fumio; and Kawanami, Katsusuke, 4,964,587, Cl. 242-78.100.
Fukushima, Nobuo: *See*—
Jinnai, Shigeru; and Fukushima, Nobuo, 4,965,682, Cl. 360-73.030.
Suzuki, Masao; Miyamoto, Ryosuke; Fukushima, Nobuo; and Ogawa, Takeshi, 4,965,449, Cl. 250-226.000.
Fukushima, Tetsuyuki; and Kobayashi, Satoru, to NEC Corporation. Digital input/out circuit capable of sending and receiving data in different modes. 4,965,766, Cl. 364-900.000.
Fukutani, Iwao: *See*—
Sakamoto, Yukio; Tanabe, Takeshi; Fukutani, Iwao; and Hori, Toshio, 4,964,806, Cl. 439-79.000.
Funabiki, Masaki: *See*—
Yamada, Teiji; and Funabiki, Masaki, 4,965,243, Cl. 502-304.000.
Funakoshi, Susumu; and Murayama, Eigoro, to Chugai Seiyaku Kabushiki Kaisha. Benzhydrylamine derivatives. 4,965,405, Cl. 562-441.000.
Funami, Fumiyasu; Kitsunezuka, Akira; Arai, Shigeharu; Sakuma, Nobuhiro; Okawara, Atsuo; and Sugiura, Tomiya, to Asahi Fiber Glass Company Limited. Resin composition and method for its preparation. 4,965,297, Cl. 523-217.000.
Funayama & Co., Ltd.: *See*—
Kajitani, Hiroshi, 4,964,201, Cl. 29-81.030.
Funayama, Osamu; Arai, Mikiro; Nishii, Hayato; and Isoda, Takeshi, to Toa Nenryo Kogyo Kabushiki Kaisha. Polysiloxazanes, silicon oxynitride fibers and processes for producing same. 4,965,058, Cl. 423-325.000.

Fung, Steven: *See—*
Woo, Sam L.; Menchen, Steven M.; and Fung, Steven, 4,965,349, Cl. 536-27.000.

Funk, Jack: *See—*
Daniels, Mark H.; Funk, Jack; Evans, Wyendell B.; and Varner, Christopher C., 4,964,340, Cl. 102-377.000.

Furbringer, Claude: *See—*
Beyeler, Paul; and Furbringer, Claude, 4,964,929, Cl. 149-109.600.

Furia, Thomas E.: *See—*
Martin, August J.; and Furia, Thomas E., 4,965,077, Cl. 426-18.000.

Furlan, Diego, to Eurosearch S.r.l. Bismuth-containing compositions suitable for therapeutic use. 4,965,382, Cl. 556-79.000.

Furukawa Circuit Foil Co., Ltd.: *See—*
Nakatsugawa, Hiroshi, 4,964,965, Cl. 204-280.000.

Furukawa, Tomomitsu: *See—*
Ichikawa, Minoru; Kashiyama, Kotaro; and Furukawa, Tomomitsu, 4,964,420, Cl. 137-171.000.

Furukawa, Yoshimi: *See—*
Sano, Shoichi; Furukawa, Yoshimi; and Hamada, Tetsuro, 4,964,481, Cl. 180-140.000.

Furuta, Hitoshi: *See—*
Akasaka, Takeshi; Ochi, Kumie; Onari, Kazuhiro; Katayama, Tsutomu; Furuta, Hitoshi; Nakae, Kazumi; and Fukuda, Satomi, 4,965,080, Cl. 426-104.000.

Fuziwara, Yutaka, to Canon Kabushiki Kaishi. Lens barrel having circuit board with polygonal aperture. 4,964,697, Cl. 350-319.000.

G.B. Electrical Inc.: *See—*
Coffey, Donald T.; Oltz, Charles H.; Roth, Donald D.; and Baran, Richard J., 4,964,525, Cl. 220-3.900.

G. D. Searle & Co.: *See—*
Baran, John S.; Lindberg, Thomas J.; and Lowrie, Harman S., 4,965,373, Cl. 549-273.000.

Gabany, Andrew J., to AMP Incorporated. Microcoaxial connector having bipartite outer shell. 4,964,805, Cl. 439-63.000.

Geboury, Michael J., to Eastman Kodak Company. BI-CMOS clock driver with reduced crossover current. 4,965,471, Cl. 307-446.000.

Gabriel, Willaim L.: *See—*
Lat, Geronimo E.; and Gabriel, Willaim L., 4,964,774, Cl. 411-446.000.

Gacsalyi, Istvan: *See—*
Rozsa, Laszlo; Petocz, Lujza; Szirt nee Kiszelly, Eniko; Fekete, Marton; Szecsey nee Hegedus, Maria; Gigler, Gabor; and Gacsalyi, Istvan, 4,965,259, Cl. 514-183.000.

Gadot Petrochemical Industries, Inc.: *See—*
Jihad, Dakka; Amikam, Zoran; and Sasson, Yoel, 4,965,406, Cl. 562-414.000.

Gaerte, Earl. Roller assembly. 4,964,741, Cl. 384-475.000.

Gais, Hans-Joachim; Erdelmeier, Irene; and Birk, Rolf, to Schering Aktiengesellschaft. Process for the E/Z stereoselective synthesis of homochiral five and six ring intermediate products. 4,964,846, Cl. 549-336.000.

Galand, Claude: *See—*
Bottau, Francoise; Galand, Claude; and Rosso, Michele, 4,965,789, Cl. 370-79.000.

Galchenko, Sergei E.: *See—*
Grischenko, Valentin I.; Kalugin, Jury V.; Paraschuk, Jury S.; Luchko, Nina A.; Chernysh, Elena N.; Tarasov, Valery F.; and Galchenko, Sergei E., 4,965,186, Cl. 435-2.000.

Galic, George J.: *See—*
Maus, Steven M.; and Galic, George J., 4,965,028, Cl. 264-297.200.

Galic/Maus Ventures: *See—*
Maus, Steven M.; and Galic, George J., 4,965,028, Cl. 264-297.200.

Gallagher, Brian J.; Schaefer, Wayne A.; and Klein, Peter P., to Delco Electronics Corporation. Forward looking windshear detection system. 4,965,573, Cl. 340-968.000.

Ganoung, David P. Engine control apparatus for improved fuel economy. 4,964,318, Cl. 74-859.000.

Gansle, Eugene R.; and Lochead, Alan, to General Electric Company. Spacecraft structure for orbital assembly and servicing. 4,964,596, Cl. 244-158.00R.

Garner, James D.; and Hinnant, John M. Concrete screeding machine. 4,964,754, Cl. 404-123.000.

Gartner, Georg F.; Janiel, Peter A.; and Lydtin, Hans-Jurgen, to U.S. Philips Corporation. Method for the plasma-activated reactive deposition of electrically conductive multicomponent material from a gas phase. 4,965,090, Cl. 427-39.000.

Garvey, Lee P.: *See—*
Potts, David C.; Win, Maug H.; and Garvey, Lee P., 4,965,000, Cl. 252-8.750.

Gas Research Institute: *See—*
Pearman, Arthur N. J.; and Woessner, Michael A., 4,965,756, Cl. 364-571.010.

Gaul, Alan R., to Dresser Industries, Inc. Flame arrestor. 4,964,882, Cl. 48-192.000.

Gaul, Richard K. Quick-release bicycle axle assembly. 4,964,287, Cl. 70-233.000.

Gaulin, Donald, to McDonald Plumbing & Heating Inc. Sprinkler connection to scrubber duct. 4,964,470, Cl. 169-56.000.

Gausman, Theodore J.; and Scheffel, Gary W., to Nupro Company. Check valve. 4,964,423, Cl. 137-543.170.

Gauthier, John A.: *See—*
Okura, David K.; Gauthier, John A.; Hill, Trevor R.; and MacKenzie, Simon A., 4,965,884, Cl. 375-106.000.

Gavalas, George R.: *See—*
Sharma, Pramod K.; Voecks, Gerald E.; and Gavalas, George R., 4,964,881, Cl. 44-620.000.

Gavula, John P.: *See—*
Harris, James E.; and Gavula, John P., 4,965,310, Cl. 524-406.000.

Gebert, Paul. Roving spinning top puzzle. 4,964,637, Cl. 273-113.000.

Gebr. Hofmann GmbH & Co. KG: *See—*
Maier, Manfred; Ruppert, Franz; and Schwab, Joachim, 4,964,299, Cl. 73-146.000.

Geha-Werke GmbH: *See—*
Strohmeyer, Willi, 4,964,579, Cl. 241-100.000.

Geier, William F. Foldable top for truck bed. 4,964,669, Cl. 296-108.000.

Geissberger, Arthur E.; Sadler, Robert A.; Luper, Paulette; and Balzan, Matthew L., to ITT Corporation. Self-aligned gate realignment employing planarizing overetch. 4,965,218, Cl. 437-41.000.

Geke, Juergen: *See—*
Schmid, Karl-Heinz; Meffert, Alfred; Schenker, Gilbert; Asbeck, Adolf; and Geke, Juergen, 4,965,019, Cl. 252-321.000.

Gelfand, David H.: *See—*
Mullis, Kary B.; Erlich, Henry A.; Gelfand, David H.; Horn, Glenn; and Saiki, Randall K., 4,965,188, Cl. 435-6.000.

Gelman Sciences, Inc.: *See—*
Kraus, Menahem; Heisler, Mark; Katsnelson, Inessa; and Velazques, Diosie, 4,964,990, Cl. 210-490.000.

Gema, S. A.: *See—*
Cabre Castellvi, Juan; Diago Meseguer, Jose ; Esteve Bianchini, Asuncion; Lenhardt Padro, Carlos E.; and Sans Pitarch, Esteve, 4,965,358, Cl. 544-357.000.

Genentech, Inc.: *See—*
Capon, Daniel J.; Lawn, Richard M.; Levinson, Arthur D.; Vehar, Gordon A.; and Wood, William I., 4,965,199, Cl. 435-69.600.
Levinson, Arthur D.; and Simonsen, Christian, 4,965,196, Cl. 435-691.000.

General Dynamics Corporation, Convair Division: *See—*
Morghen, Manfred, 4,964,218, Cl. 33-293.000.

General Dynamics Corporation, Pomona Div.: *See—*
Schlunt, Richard S., 4,965,761, Cl. 364-726.000.

General Dynamics Corp., Pomona Division: *See—*
Bastian, Thomas W.; and Schertz, Charles W., 4,964,339, Cl. 102-376.000.

General Electric Company: *See—*
Arnold, David; and Kowalczyk, Karen B., 4,965,418, Cl. 200-144.00R.
Economy, Richard; Steiner, Walter R.; and Fadden, Richard G., Jr., 4,965,745, Cl. 364-518.000.
Gansle, Eugene R.; and Lochead, Alan, 4,964,596, Cl. 244-158.00R.
Glazebrook, Ellis, 4,965,854, Cl. 455-224.000.
Ipri, Alfred C.; and Stewart, Roger G., 4,965,646, Cl. 357-23.700.
Katz, Allen, 4,965,530, Cl. 330-295.000.
Kelaita, Joseph B., Jr.; Arnold, David; and Smith, James I., 4,965,544, Cl. 335-202.000.
Kleinknecht, Hans P.; and Knop, Karl H., 4,964,726, Cl. 356-357.000.
Ngo, Khai D. T., 4,965,709, Cl. 363-37.000.
Peters, Edward N.; Bookbinder, Dana; and Cella, James A., 4,965,337, Cl. 528-353.000.
Pratt, Charles F.; Phadke, Shrikant V.; and Olivier, Errol, 4,965,111, Cl. 428-36.800.
Roovers, Wilhelmus M. M.; and Verhoeven, Jeroen J., 4,965,308, Cl. 524-421.000.
Ryan, Rodger, 4,965,547, Cl. 340-870.350.
Tabankia, Farshid M. H.; and de Boer, Jan, 4,965,338, Cl. 528-272.000.
Willis, Robert J., Jr., 4,964,315, Cl. 74-665.0GA.

General Electric Company, p.l.c., The: *See—*
Edwards, John W.; and Dekker, Nicolaas M. J., 4,965,832, Cl. 381-71.000.
McDonald, Neil A., 4,965,827, Cl. 380-25.000.

General Mills, Inc.: *See—*
Seaborne, Jonathan, 4,965,423, Cl. 219-10.55E.
Seaborne, Jonathan, 4,965,427, Cl. 219-10.55E.

General Signal Corporation: *See—*
Markle, David A., 4,964,705, Cl. 350-442.000.
Trenary, Dale T., 4,965,865, Cl. 324-158.00P.

Genfan, German S., to Merchant, James T. Planing boat. 4,964,357, Cl. 114-274.000.

Genhone Lai: *See—*
Lai, Genhone, 4,964,645, Cl. 273-73.00J.

Gentelia, John S.: *See—*
Abraham, William W.; and Gentelia, John S., 4,965,126, Cl. 428-343.000.

Gentex Corporation: *See—*
Weymouth, Russell F., Jr.; McNamara, John J.; and Cianflone, Joseph A., 4,964,714, Cl. 351-62.000.

Genvention, Inc.: *See—*
Towsend, Marvin S., 4,965,425, Cl. 219-10.55F.

Georg Spiess GmbH: *See—*
Klingl, Karl-Heinz, 4,964,498, Cl. 198-347.100.

George, David A.; and Rathi, Bharat D., to International Business Machines Corporation. Data processing system incorporating a memory resident directive for synchronizing multiple tasks among plurality of processing elements by monitoring alternation of semaphore data. 4,965,718, Cl. 364-200.000.

Georgel, Jean-Claude: *See—*
Auvert, Geoffroy; Georgel, Jean-Claude; and Guerin, Yves, 4,964,940, Cl. 156-345.000.

Georlette, Pierre; Goren, Hanoch; Shmilowitz, Shaul; and Teuerstein, Avraham, to Bromine Compounds Limited. Flame retardant plastic materials and method for producing same. 4,965,021, Cl. 252-609.000.

Geostar Corporation: *See—*
O'Neill, Gerard K., 4,965,586, Cl. 342-357.000.

Gerber Scientific Instrument Company, The: *See—*
Straayer, Ronald J., 4,965,749, Cl. 364-520.000.

Gerhard Klemm Maschinenfabrik GmbH & Co.: *See—*
Klemm, Gerhard, 4,964,335, Cl. 101-129.000.

Gerin, Merin: *See—*
Batteux, Pierre, 4,965,543, Cl. 335-174.000.

German, Paul G.: *See—*
Ball, Robert C.; and German, Paul G., 4,964,368, Cl. 119-14.490.

Gernand, Wolfgang: *See—*
Wieland, Gerhard; Steckenreuter, Klaus; Gernand, Wolfgang; and Simgen, Helmut, 4,964,521, Cl. 215-32.000.

Gesellschaft fuer Hybrid und Wasserstofftechnik mbH: *See—*
Halene, Clemens, 4,964,524, Cl. 220-3.000.

Getz, Carl M. Tornado engine. 4,964,384, Cl. 123-306.000.

Geyer, Calvin J.: *See—*
Lindsay, David S.; and Geyer, Calvin J., 4,964,738, Cl. 381-97.000.

Giancarlo, Gazia; and Marzio, Nocchi, to Nolan S.p.A. Safety helmet for motor-cyclists provided with manually-adjustable ventilation means. 4,964,178, Cl. 2-414.000.

Giarda, Andrea; and Ceresara, Sergio, to Europe Metalli - LMI S.p.A. Copper-based alloy for obtaining aluminum-beta-brasses, containing grain size reducing additives of titanium and niobium. 4,965,045, Cl. 420-478.000.

Gibot, Claude, to Carboxyque Francaise. Isothermal container with reservoir for refrigerant and its use for the transportation of fresh products. 4,964,283, Cl. 62-384.000.

Giesbrecht, Wayne E.; Phillips, Howard C.; and Erb, David J., to AMP Incorporated. Lead making machine having improved crimping presses and actuating mechanism. 4,964,200, Cl. 29-33.00M.

Giganti, Mario: *See—*
Vasconi, Enrico; Mazzucchelli, Carlo; Torriani, Diego; and Giganti, Mario, 4,965,848, Cl. 388-815.000.

Gigler, Gabor: *See—*
Rozsa, Laszlo; Petocz, Lujza; Szirt nee Kiszelly, Eniko; Fekete, Marton; Szecsey nee Hegedus, Maria; Gigler, Gabor; and Gacsalyi, Istvan, 4,965,259, Cl. 514-183.000.

Gilbert, James R.: *See—*
Grimmer, Derrick P.; Paulson, Kenneth R.; and Gilbert, James R., 4,965,655, Cl. 357-71.000.

Gilda, Glenn D.: *See—*
Baker, Don L.; Gilda, Glenn D.; Quinn, Terrence A.; and Shaukatullah, Hussain, 4,964,737, Cl. 374-179.000.

Gillett, John B.: *See—*
Duspiva, Walter S.; Gillett, John B.; and Spreen, James H., 4,965,712, Cl. 363-126.000.

Gillette Company, The: *See—*
Kawan, Antoine, 4,965,071, Cl. 424-401.000.
Welsh, Norman C.; and Oglesby, Oliver D., 4,964,214, Cl. 30-49.000.

Gilmore, Robert P., to Qualcomm, Inc. Direct digital synthesizer driven phase lock loop frequency synthesizer. 4,965,533, Cl. 331-18.000.

Gipson, William P.; Mason, Michael W.; and Hensler, Thomas A., to Procter & Gamble Company, The. Detachable two piece absorbent garment. 4,964,860, Cl. 604-391.000.

Girod, Bernd; and Adelson, Edward H., to Massachusetts Institute of Technology. System for ascertaining direction of blur in a range-from-defocus camera. 4,965,442, Cl. 250-201.700.

Glace, William R.: *See—*
Ibsen, Robert L.; and Glace, William R., 4,964,911, Cl. 106-35.000.

Glazebrook, Ellis, to General Electric Company. Noise blanker with continuous wave interference compensation. 4,965,854, Cl. 455-224.000.

Gleason, Patrick D., to H. B. Fuller Company. Labeling method employing starch-based adhesive formulation containing rosin composition. 4,964,939, Cl. 156-336.000.

Glidden, Allen L., Jr. Fence frame. 4,964,619, Cl. 256-32.000.

Gloor, Peter, to Rosy B. Versand GmbH. Drive shaft with a coupling arrangement. 4,964,839, Cl. 464-29.000.

Glynn, Donald J. Universal long gun support and holster. 4,964,553, Cl. 224-149.000.

Gobel, Richard J., to Beloit Corporation. High turndown rotary dryer flights. 4,964,226, Cl. 34-136.000.

Goddard, George: *See—*
Fabry, Ehrenfried; Goddard, George; and Meyer, Dieter, 4,965,564, Cl. 340-784.000.

Goertz, Hans-Helmut: *See—*
Baur, Richard; Stoeckigt, Dieter; Neumann, Hans-Werner; Goertz, Hans-Helmut; and Wagner, Norbert, 4,965,009, Cl. 252-142.000.

Goetz, Kenneth D.; and Munro, Bradley L., to Phillips Friedman Company. N-methyl-2-pyrrolidone purification. 4,965,370, Cl. 548-555.000.

Goetz, Klaus: *See—*
Hoffrichter, Bernd; Pavelka, Bozidar; Pfefferkorn, Dietmar; Schaeffer, Norbert; and Goetz, Klaus, 4,964,588, Cl. 242-199.000.

Goetzberger, Adolf, to Fraunhofer-Gesellschaft zur Forderund der Forschung E. V. Concentrator arrangement. 4,964,713, Cl. 350-629.000.

Goetze AG: *See—*
Stephan, Bernd, 4,964,647, Cl. 277-153.000.

Goggi, Francesco. Ecological panel for obtaining in particular bank defences by hinging it to identical panels. 4,964,757, Cl. 405-30.000.

Goguillon, Didier: *See—*
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Goheen, Leo A.: *See—*
Schofield, Paul J.; and Goheen, Leo A., 4,965,740, Cl. 364-512.000.

Goldberg, Eugene P.; and Yalon, Moshe, to University of Florida. Viscoelastic material for ophthalmic surgery. 4,965,253, Cl. 514-54.000.

Goldkuhle, Gerhard; and Sussnapp, Gunter, to Licentia-Patent-Verwaltungs-GmbH. Mail stacker. 4,964,982, Cl. 209-539.000.

Goldovsky, Viktor L.; Stetsovich, Viktor I.; and Zayats, Andrei J. Correlational gas analyzer. 4,964,725, Cl. 356-308.000.

Goldsmith, Susan H.; and Grundelman, George P. Method of making membrane-type filter and product thereof. 4,964,992, Cl. 210-500.360.

Gollinger, Franz X.: *See—*
Bock, Georg; Gollinger, Franz X.; and John, Thomas, 4,964,336, Cl. 101-157.000.

Gomeigaisha Kurose & Co.: *See—*
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Gonzales, Teodoro J., to Price Pfister, Inc. Water facet inlet line connector. 4,964,657, Cl. 285-8.000.

Gonzalez, Fernando: *See—*
Dennison, Charles H.; and Gonzalez, Fernando, 4,965,221, Cl. 437-70.000.

Gonzalez, Rene . Structural panel. 4,965,138, Cl. 428-593.000.

Good, Jackson J. Apparatus and method for bending dental wire. 4,964,800, Cl. 433-3.000.

Gooden, Eldon. Tabacco processing pneumatic alignment method and apparatus. 4,964,500, Cl. 198-380.000.

Goodwin, Raymond G.: *See—*
Namen, Anthony E.; Goodwin, Raymond G.; Lupton, Stephen D.; and Mochizuki, Diane Y., 4,965,195, Cl. 435-69.520.

Goodyear Tire & Rubber Company, The: *See—*
Ring, Ralph D., 4,964,931, Cl. 156-131.000.
Stachowiak, Robert W.; Puccio, Anthony J.; and Eberhart, Thomas J., 4,965,327, Cl. 526-88.000.

Gootzen, Wilhelmus F. M.; and Osinski, Kazimierz, to U.S. Philips Corporation. Method of forming an interconnection between conductive levels. 4,965,226, Cl. 437-189.000.

Gopsill, Christopher C.: *See—*
Norman, Seth I.; Stringfield, Richard T.; and Gopsill, Christopher C., 4,965,083, Cl. 426-422.000.

Gordon, David G.; and Winkler, Carol A. Dignity gowns. 4,964,173, Cl. 2-114.000.

Gordon, Paul F.: *See—*
Allen, Simon; Gordon, Paul F.; and Morley, John O., 4,965,020, Cl. 252-587.000.

Gordon, Robert L., to International Paper Co. Gable top container having a pour spout fitment. 4,964,562, Cl. 229-125.150.

Goren, Hanoch: *See—*
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Gorman, William W., Jr.: *See—*
Brautigam, Kathe L.; and Gorman, William W., Jr., 4,964,961, Cl. 204-182.300.

Gosselin, Robert G., to Fiskars Oy AB. Torque limiting device for shears. 4,964,216, Cl. 30-254.000.

Gosteli, Jacques; and Warm, Aleksander, to Lonza Ltd. Process for the production of 4,5,6,7-tetrahydrothieno-[3,2-C]-pyridines. 4,965,359, Cl. 546-114.000.

Gotoda, Yusuke: *See—*
Shizaki, Tomoo; Kawaguchi, Yoshiyuki; Nakano, Yasuhiko; Gotoda, Yusuke; and Takemura, Hiroo, 4,964,381, Cl. 123-73.00A.

Gotou, Miyuki; and Takeuchi, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Wire electrical discharge machining apparatus. 4,965,428, Cl. 219-69.120.

Gottschald, Lutz; and Eickmeyer, Klaus, to Wernicke & Co. GmbH. Machine for grinding the edges of a lens. 4,964,239, Cl. 51-101.0LG.

Gould, Herbert J., to International Rectifier Corporation. Metallizing process and structure for semiconductor devices. 4,965,173, Cl. 430-317.000.

Goulder, David P., to U.S. Philips Corporation. Liquid chromatograph. 4,964,985, Cl. 210-198.200.

Goupil, Jean-Claude: *See—*
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Graaff Kommanditgesellschaft: *See—*
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Graaff, Wolfgang, to Graaff Kommanditgesellschaft. Bottom panel for containers. 4,964,530, Cl. 220-442.000.

Graf, Josef: *See—*
Schermanz, Karl; Saischek, Gerald; Kores, Dietmar; Graf, Josef; Haas, Gerhard; and Martetschlager, Kurt, 4,965,277, Cl. 514-385.000.

Grahn, Allen R.; and Astle, Lynn. Tactile sensor. 4,964,302, Cl. 73-865.700.

Granger, Edward M.: *See—*
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Granowski, Robert: *See—*
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Grass Valley Group, Inc., The: *See—*
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Grassart, Francis, to ACEC, Societe Anonyme. Process and device for decoding a code signal. 4,965,757, Cl. 364-576.000.

Grasselli, Robert K.: *See—*
Weaver, John H.; Grasselli, Robert K.; Nelson, David L.; Meyer, Harry M., III; and Hill, Donald M., 4,965,244, Cl. 505-1.000.

Gray, Henry F.; and Campisi, George J., to United States of America, Navy. Process for fabricating self-aligned field emitter arrays. 4,964,946, Cl. 156-643.000.

Great Lakes Chemical Corporation: *See—*
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Grebe, Kurt R.: *See—*
Flint, Ephraim B.; Grebe, Kurt R.; Gruber, Peter A.; and Zingher, Arthur R., 4,964,458, Cl. 165-80.400.

Green, George D.; and Mullauer, William C., to Microcomputer Doctors, Inc. Method and apparatus for testing integrated circuit memories. 4,965,799, Cl. 371-21.200.

Greenberg, Richard S.: *See—*
Cuomo, John; Greenberg, Richard S.; and Olson, Richard E., 4,965,280, Cl. 514-383.000.
Cuomo, John; Greenberg, Richard S.; and Olson, Richard E., 4,965,281, Cl. 514-399.000.

Greenwood, John M.: *See—*
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Greetham, Geoffrey, to Manganese Bronze Limited. High density sintered ferrous alloys. 4,964,908, Cl. 75-241.000.

Gregg, David P., to Del Mar Avionics. Optical disk manufacturing process. 4,964,934, Cl. 156-219.000.

Greidanus, Pieter J.; Feijen, Jan; Eenink, Marinus J. D.; Rieke, Johannes C.; Olijslager, Jan; and Albers, Jan H. M., to Nederlandse Organisatie Voor Toegepast-Natuurwetenschappe Lijk. Biodegradable polymer substrates loaded with active substance suitable for the controlled release of the active substance by means of a membrane. 4,965,128, Cl. 428-398.000.

Griffis, Steven C. Apparatus for transporting a person from a contaminated area to a decontamination facility. 4,964,899, Cl. 55-356.000.

Griffiths, John M.: *See—*
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Grim, Tracy E.; and Haines, Jeffrey R., to Royce Medical Company. Orthopedic device having gel pad with phase change material. 4,964,402, Cl. 128-80.00H.

Grimmer, Derrick P.; Paulson, Kenneth R.; and Gilbert, James R., to Minnesota Mining and Manufacturing Company. Interconnected semiconductor devices. 4,965,655, Cl. 357-71.000.

Grischenko, Valentin I.; Kalugin, Jury V.; Luchko, Nina A.; and Chernysh, Elena N. Method for low-temperature preservation of embryos. 4,965,185, Cl. 435-1.000.

Grischenko, Valentin I.; Kalugin, Jury V.; Paraschuk, Jury S.; Luchko, Nina A.; Chernysh, Elena N.; Tarasov, Valery F.; and Galchenko, Sergei E. Method for low-temperature preservation of spermatozoa. 4,965,186, Cl. 435-2.000.

Gross, Erwin: *See—*
Normann, Norbert; Gross, Erwin; and Schlager, Harald, 4,965,689, Cl. 360-131.000.

Gruber, Peter A.: *See—*
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Gruber, Robert J.; Yourd, Raymond A., III; Julien, Paul C.; Bolte, Steven B.; and Knapp, John F., to Xerox Corporation. Toner compositions with modified charge enhancing additives. 4,965,158, Cl. 430-106.600.

Gruetle, Charles. Dispensing fish lure. 4,964,235, Cl. 43-42.060.

Grundelman, George P.: *See—*
Goldsmith, Susan H.; and Grundelman, George P., 4,964,992, Cl. 210-500.360.

Guell, Thomas C., to Pall Corporation. Membranes with low protein adsorbability. 4,964,989, Cl. 210-490.000.

GTE Airfone Incorporated: *See—*
Hollowed, Edward J.; and Oldani, Jerome L., 4,965,824, Cl. 379-428.000.

GTE Laboratories Incorporated: *See—*
Sarin, Vinod K., 4,965,140, Cl. 428-698.000.

GTE Mobilnet Incorporated: *See—*
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GTE Products Corporation: *See—*
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Ratner, Elizabeth L., 4,965,490, Cl. 313-569.000.
Westlund, Arnold E., Jr.; Boyd, John M.; and Fleming, Raymond T., 4,964,829, Cl. 445-22.000.
Whalen, Greg R., 4,965,703, Cl. 362-61.000.

GTE Valenite Corporation: *See—*
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Guecia, Gregory C. J.: *See—*
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Gueret, Jean-Louis, to L'Oreal. Dispensing device for mixing an additive. 4,964,541, Cl. 222-137.000.

Guerin, Yves: *See—*
Auvert, Geoffroy; Georgel, Jean-Claude; and Guerin, Yves, 4,964,940, Cl. 156-345.000.

Guerini, Albert J.: *See—*
Thompson, Herbert E.; Rolph, Donald L.; Mercurio, Dominic; and Guerini, Albert J., 4,965,685, Cl. 360-97.010.

Guevel, Pierre; Landel, Eric; Manzone, Jean-Michel; and Bouchet, Rene , to Principia Recherche Developement S.A. Tide attenuator. 4,964,756, Cl. 405-26.000.

Guibert, Paul; and Launay, Francis A. P., to Quartz & Silice. Method of extracting spin cast fused silica. 4,964,902, Cl. 65-71.000.

Guillet, Hubert; and Vialle, Dominique, to Micro-Controle. Adaptable laser apparatus. 4,965,807, Cl. 372-92.000.

Guliker, Hendrik J., to Fokker Special Products B.V. Joining system for joining wall panels to form a box-like housing. 4,964,252, Cl. 52-275.000.

Gunn, Dennis R. Power supply system. 4,965,877, Cl. 363-146.000.

Gupta, Sanjay: *See—*
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Gurny, Werner: *See—*
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Guskov, Igor A.: *See—*
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Gutierrez, Antonio: *See—*
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Guzzetta, Charles A.: *See—*
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Guzzetta, Gerald J.; Hornberger, David E.; Guzzetta, Charles A.; and Schadt, Larry M., to Guzzetta, Gerald J. Apparatus for selectively rotating a tool relative to the wall of a conduit. 4,964,759, Cl. 405-154.000.

H. B. Fuller Company: *See—*
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H. Van Eldern Holding B.V.: *See—*
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Haarmann & Reimer Corporation: *See—*
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Haas, Gerhard: *See—*
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HAC: *See—*
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Haczek, Werner: *See—*
Haftmann, Johannes; and Haczek, Werner, 4,964,743, Cl. 400-208.100.

Haddad, Muin S.; and Eryman, William S., to Amoco Corporation. Maleic anhydride catalysts and process for their manufacture. 4,965,235, Cl. 502-209.000.

Hadley, G. Ronald: *See—*
Ashby, Carol I. H.; Hadley, G. Ronald; Hohimer, John P.; and Owyoung, Adelbert, 4,965,806, Cl. 372-45.000.

Haferl, Peter E., to RCA Licensing Corporation. Protection arrangement of a deflection circuit. 4,965,496, Cl. 315-371.000.

Hafner, Hans W., to Pfister GmbH. Method and apparatus for improving the operational characteristics of a vehicle. 4,965,729, Cl. 364-426.030.

Haftmann, Johannes; and Haczek, Werner, to TA Triumph-Adler Aktiengesellschaft. Receptacle for a holder for a ribbon for use in typewriters or similar machines. 4,964,743, Cl. 400-208.100.

Hagenfeldt, Carl P. U.; and Roos, Annika M., to Sandvik AB. Medical implant made of a stainless steel alloy. 4,964,925, Cl. 148-325.000.

Hager, Brian G.: *See—*
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Haghiri, Mohammad-Reza, to U.S. Philips Corporation. Method of and arrangement for estimating and compensating motion in a sequence of pictures and a picture transmission system provided with such an arrangement. 4,965,666, Cl. 358-105.000.

Hagiuda, Yasuhiro: *See—*
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Haiduk, William. Perfume dispenser. 4,964,570, Cl. 239-36.000.

Haines, Jeffrey R.: *See—*
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Hakansson, Philip: *See—*
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Hakiri, Minoru: *See—*
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Hako Minuteman, Inc.: *See—*
Rau, Jerome E.; Palmer, Gary E.; and Labrador, Grace D., 4,964,189, Cl. 15-327.200.

Halamka, John D. Computer card. 4,965,727, Cl. 364-419.000.

Halene, Clemens, to Gesellschaft fuer Hybrid und Wasserstofftechnik mbH. Pressure vessel for hydrogen storage. 4,964,524, Cl. 220-3.000.

Halevy, Eyal; and Amir, Michael. Airborne birdstrike prevention device. 4,964,331, Cl. 89-37.190.

Haley, Mark V.; and Landis, Wayne G., to United States of America, Army. Biodegradation of 1,4-dibenz-oxazepine and related compounds. 4,965,202, Cl. 435-170.000.

Hall, Steven E.: *See—*
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Halliburton Company: *See—*
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Halm, Roland L.; Zapp, Regie H.; and Streu, Rick D., to Dow Corning Corporation. Method for preparing organohalosilanes. 4,965,388, Cl. 556-472.000.

Hamabata, Mitsuo: *See—*
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Hamada, Tetsuro: *See—*
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Hamada, Yoshitsugu: *See—*
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Hamaguchi, Koji; Togashi, Fumihiko; and Miyauchi, Yoshitaka, to Kao Corporation. Deinking composition for reclamation of waste paper. 4,964,949, Cl. 162-5.000.

Hamamoto, Takeshi: *See—*
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Hamari Chemicals, Ltd.: *See—*
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Hamatsu, Masahiro: *See—*
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Hambrecht, Juergen: *See—*
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Hamburg, John: *See—*
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Hanajima, Toshiharu: *See—*
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Hancock, Clarence L.: *See—*
Alexander, Thomas A.; Daher, Lawrence J.; Hancock, Clarence L.; and Peterson, Donald L., 4,965,072, Cl. 424-458.000.

Handa, Akira: *See—*
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Handa, Jun-ichi; Ito, Hiroshi; and Minohara, Taketoshi, to Toyota Jidosha Kabushiki Kaisha. Two-tone paint film. 4,965,098, Cl. 428-203.000.

Handa, Yasunobu; Hoshimiya, Nozomu; Oda, Takashi; and Tanimoto, Yoshinori. Electrode for use in implanting in a living body. 4,964,414, Cl. 128-784.000.

Handbury Limited: *See—*
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Haneda, Hideo: *See—*
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Hanerus, Goran; and Ljungstrom, Tommy, to Roby Teknik Aktiebolag. Apparatus for cleaning a filling pipe. 4,964,444, Cl. 141-90.000.

Hanke, Kurt F.; Lund, Wesley C.; and Feider, David F., to Boeing Company, The. Vacuum pickup tool with integrally heated soldering tip. 4,965,433, Cl. 219-230.000.

Hanna, Emmanuel A.; and Loewenthal, Henry J., to Bobrick Washroom Equipment, Inc. Push up dispenser with capsule valve. 4,964,544, Cl. 222-181.000.

Hanning Electro-Werke GmbH & Co.: *See—*
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Hannuki, Kouzou: *See—*
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Hansen, Robert A.: *See—*
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Hansen, Steven K., to Brunswick Corporation. Detonation control system for a marine engine. 4,964,387, Cl. 123-425.000.

Hanson, Eric G.: *See—*
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Hanssler, Gerd: *See—*
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Haq, Zia: *See—*
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Hara, Naoki: *See—*
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Hara, Ryuichi: *See—*
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Harbeke, Gerold J. Shower strainer mounting assembly. 4,964,180, Cl. 4-288.000.

Harder, Wolfgang: *See—*
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Harnden, Michael R.; Wyatt, Paul G.; and Bailey, Stuart, to Beecham Group p.l.c. Purine derivatives. 4,965,270, Cl. 514-262.000.

Harnischfeger Corporation: *See—*
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Harrington Arthritis Research Center: *See—*
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Harris Corporation: *See—*
Chan, Luen C.; and Kautz, Kenrick W., 4,965,845, Cl. 382-56.000.
Coffelt, Steven R.; and Durston, Thomas W., 4,965,795, Cl. 370-110.100.

Harris, Jack W. Portable vehicle heater. 4,965,432, Cl. 219-203.000.

Harris, James E.; and Gavula, John P., to Amoco Corporation. Wear resistant poly (aryl ether ketone) polyimide blends. 4,965,310, Cl. 524-406.000.

Harris, James E.: *See—*
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Harris, Richard A.: *See—*
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Harrison, Daniel J.: *See—*
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Harrison, Danny E.; and Zekoski, Joseph. Pneumatic tires. 4,964,452, Cl. 152-554.000.

Hart, James D.: *See—*
Long, Russell L.; and Hart, James D., 4,964,347, Cl. 105-404.000.

Hart, Peter: *See—*
Sharpe, Robin; Hart, Peter; and Van de Mortel, Petrus P., 4,965,820, Cl. 379-59.000.

Hartman, Thomas J. Dock bumper guard. 4,964,760, Cl. 405-215.000.

Hartmann, Ludwig A.; and Stephen, John F., to ICI Americas Inc. Difunctional polyfluoroaromatic derivatives and a process of preparing the same. 4,965,394, Cl. 558-425.000.

Hartmann, Richard, Jr.; and Nolan, John H., to Alpha Industries, Inc. Cut-off machine. 4,964,325, Cl. 83-321.000.

Haruna, Hideaki; and Azeura, Hiroki, to Tsubakimoto Chain Co. Pallet in frictionally driven roller type transfer apparatus. 4,964,343, Cl. 104-166.000.

Haruna, Hideaki: *See—*
Wakita, Yuji; and Haruna, Hideaki, 4,964,776, Cl. 414-277.000.

Haruta, Masahiro: *See—*
Arai, Ryuichi; Haruta, Masahiro; Yamamoto, Nobuko; Yano, Tetsuya; Kishi, Hiroyoshi; and Sakuranaga, Masanori, 4,965,174, Cl. 430-340.000.

Haruyuki Kawahara: *See—*
Kawahara, Haruyuki; Tanaka, Katsumi; Ashiura, Yasuyuki; and Yoshimura, Motonobu, 4,964,801, Cl. 433-173.000.

Harvey, John C.; and Cuddihy, James W., to Personalized Mass Media Corporation, The. Signal processing apparatus and methods. 4,965,825, Cl. 380-9.000.

Hasegawa, Hideo: *See—*
Umetsu, Yukihide; Hasegawa, Hideo; Takahashi, Toshio; and Miyagawa, Masayuki, 4,964,522, Cl. 215-100.00A.

Hasegawa, Hirofumi; Ohmori, Naoto; Yamada, Yukio; and Yoshida, Narutaka, to Minolta Camera Kabushiki Kaisha. Image forming apparatus with use of a laser beam. 4,965,870, Cl. 355-68.000.

Hasegawa, Hiroto: *See—*
Ohtsuka, Yasumasa; Hasegawa, Hiroto; and Tanigawa, Koichi, 4,965,747, Cl. 364-519.000.

Hasegawa, Kouyo, to Canon Kabushiki Kaisha. Information reproducing apparatus. 4,965,440, Cl. 235-487.000.

Hasegawa, Masakazu: *See—*
Sugimoto, Masaru; Kohno, Osamu; Ikeno, Yoshimitsu; Sadakata, Nobuyuki; Nakagawa, Mikio; Aoki, Shin'ya; Tan, Masayuki; Okini, Ryuichi; Yoshida, Syotaro; Hasegawa, Masakazu; and Yamanouchi, Hiroshi, 4,965,245, Cl. 505-1.000.

Hasegawa, Yutaka: *See—*
Katoh, Eiichi; Asakura, Koichi; Hasegawa, Yutaka; and Bando, Toshiro, 4,965,637, Cl. 355-246.000.

Hashida, Koichi: *See—*
Nokubo, Seiji; Kohno, Teruhisa; Hashida, Koichi; Matsumoto, Atsuo; and Higashimura, Hideaki, 4,964,680, Cl. 303-115.000.

Hashimoto, Koji; Kumagai, Naokazu; Asami, Katsuhiko; and Kawashima, Asahi, to Daiki Engineering Co., Ltd.; and Koji Hashimoto.

Surface activated alloy electrodes and process for preparing them. 4,964,967, Cl. 204-292.000.

Hashimoto, Masashi: *See*—
Oku, Teruo; Kawai, Yoshio; Kayakiri, Hiroshi; Kuratani, Kazuyoshi; and Hashimoto, Masashi, 4,965,274, Cl. 514-311.000.

Hashimoto, Mitsuru; Shimada, Tomoyuki; Suzuki, Nobuo; Sakai, Takayuki; Suzuka, Susumu; and Sasaki, Masaomi, to Ricoh Company, Ltd.; and Hodogaya Chemical Company, Ltd. Electrophotographic photoconductor and polyolefin derivatives employed in the same photoconductor. 4,965,157, Cl. 430-80.000.

Hashimoto, Shuichi, to Fujitsu Limited. Servo circuit. 4,965,501, Cl. 318-595.000.

Hashimoto, Tadahiko: *See*—
Tachikawa, Makoto; Suzuki, Osamu; Hashimoto, Tadahiko; Igari, Kuniyuki; and Katsuyama, Ichirou, 4,964,719, Cl. 353-85.000.

Hashimoto, Yoshihiro: *See*—
Murai, Teruyuki; Hashimoto, Yoshihiro; and Kawakita, Takao, 4,964,209, Cl. 29-527.600.

Hashizume, Takuji: *See*—
Kanoo, Fumihiko; Yamane, Takehiko; Kondo, Hideo; Hashizume, Takuji; Yamashita, Katsuji; Hosoe, Kazunori; Kuze, Fumiyuki; and Watanabe, Kiyoshi, 4,965,261, Cl. 514-229.500.

Hass, David L. Foldable game board and method of making the same. 4,964,643, Cl. 273-285.000.

Hass, Martin M. Air-isometric temporomandibular joint and vertical closure jaw relator apparatus. 4,964,769, Cl. 433-214.000.

Hastings, Otis H., to No Fire Engineering, Inc. Intumescent fire-retardant and electrically-conductive coating material. 4,965,296, Cl. 523-179.000.

Hata, Ryosuke; Yamanouchi, Shosuke; Hirose, Masayuki; Kuwabara, Hidemitsu; Mizumoto, Yasuharu; and Hagiuda, Yasuhiro, to Sumitomo Electric Industries, Ltd. Method for producing an insulating polyolefin laminated paper. 4,964,933, Cl. 156-209.000.

Hatanaka, Katsunori; Uzawa, Shunichi; Nakagawa, Katsumi; and Komatsu, Toshiyuki, to Canon Kabushiki Kaisha. Photoelectric conversion apparatus. 4,965,570, Cl. 340-825.790.

Hatano, Masato: *See*—
Seko, Kiyoshi; Hatano, Masato; and Suzuki, Shigeki, 4,964,258, Cl. 53-75.000.

Hatta, Naoyuki: *See*—
Sangyoji, Kazuo; Yamamoto, Takemi; Hatta, Naoyuki; Sakakibara, Kenji; Asano, Yuji; Hara, Yoshimasa; Matsumoto, Yumio; and Hayakawa, Kiyoharu, 4,965,592, Cl. 346-110.00R.

Hattori, Jun: *See*—
Suda, Shigeyuki; and Hattori, Jun, 4,964,703, Cl. 350-413.000.

Haupt, Eberhard: *See*—
Altmann, Dieter; Haupt, Eberhard; and Knuppel, Manfred, 4,964,674, Cl. 297-180.000.

Hauser, Herbert P.: *See*—
Brann, Peter B.; Hauser, Herbert P.; and Stefanescu, Alexander, 4,964,288, Cl. 70-406.000.

Hauser-Kuhrts, Inc.: *See*—
Kuhrts, Eric H., 4,965,252, Cl. 514-54.000.

Havel, Karel. Continuously variable color optical device. 4,965,561, Cl. 340-762.000.

Haverkamp, Hans, to Hanning Electro-Werke GmbH & Co. Device for emptying a liquid-collection tank in a water-conducting household appliance. 4,964,783, Cl. 415-52.100.

Hawe, William: *See*—
Hutchison, Jerry; Yang, Henry; and Hawe, William, 4,965,791, Cl. 370-94.100.

Hayakawa, Kiyoharu: *See*—
Sangyoji, Kazuo; Yamamoto, Takemi; Hatta, Naoyuki; Sakakibara, Kenji; Asano, Yuji; Hara, Yoshimasa; Matsumoto, Yumio; and Hayakawa, Kiyoharu, 4,965,592, Cl. 346-110.00R.

Hayasaka, Toshiaki: *See*—
Ogura, Masaaki; Ohta, Kiyotaka; Kurokawa, Junji; Ito, Masaji; and Hayasaka, Toshiaki, 4,965,871, Cl. 355-55.000.

Hayashi, Koji: *See*—
Yokoe, Masaaki; Kurono, Yoshikazu; Hayashi, Koji; Takagi, Tomoe; Matsushita, Narihiro; and Takagi, Yuzo, 4,964,352, Cl. 112-103.000.

Hayashi, Masatoshi: *See*—
Shinohara, Toshio; and Hayashi, Masatoshi, 4,965,387, Cl. 556-440.000.

Hayashi, Shinichi, to Olympus Optical Co., Ltd. Differential interference microscope. 4,964,707, Cl. 350-510.000.

Hayashi, Shinichi: *See*—
Kametaka, Shigeru; Miyazaki, Tadaaki; Hayashi, Shinichi; Handa, Akira; and Kameda, Kinya, 4,965,262, Cl. 514-230.200.

Hayduk, Edward A., Jr.; Yext, Walter F.; and Taschler, David R. Process for the manufacture of copper thick-film conductors using an infrared furnace. 4,965,092, Cl. 427-96.000.

Hayes, Cecil L., to Rockwell International Corporation. Dither-free actively stabilized laser. 4,965,805, Cl. 372-32.000.

Hayes, Earl J., Sr.; Johnson, Daniel L.; and Martin, Galen M., to AMP Incorporated. Electrical junction connector having wire-receiving slots. 4,964,811, Cl. 439-398.000.

Hayes, Harry: *See*—
Nimmey, Alan; and Hayes, Harry, 4,964,538, Cl. 222-92.000.

Hayes, Raymond: *See*—
Yang, Kei-Wean C.; Taggart, John E.; Hayes, Raymond; and Peter, Joseph R., 4,965,648, Cl. 357-24.000.

Haynes, Howard D.; and Eisenberg, David M., to Martin Marietta Energy Systems, Inc. Motor current signature analysis method for diagnosing motor operated devices. 4,965,513, Cl. 324-158.0MG.

Hazen, Gary A.; and Macune, Don T., to Schlumberger Technology Corporation. Multifrequency signal transmitter with attenuation of selected harmonies for an array induction well logging apparatus. 4,965,522, Cl. 324-339.000.

He, Yi: *See*—
Shiflet, Gary J.; Poon, S. Joseph; and He, Yi, 4,964,927, Cl. 148-403.000.

Heath, Perry C.: *See*—
Chou, Ta-Sen; Heath, Perry C.; and Patterson, Lawrence E., 4,965,374, Cl. 549-313.000.

Hebert, John R., to AAI Corporation. Projectile with ram air-extendible probe and ram air-extendible probe assembly therefor. 4,964,341, Cl. 102-501.000.

Hediger, Edwin A., to Eastman Kodak Company. Drive arrangement for moving a document scanner. 4,965,638, Cl. 355-235.000.

Heffner, Joseph H.; Seener, G. Thomas; and Hoehne, Dennis L., to Sporlan Valve Company. Expansion and check valve combination. 4,964,567, Cl. 236-92.00B.

Heidelberger Druckmaschinen AG: *See*—
Rodi, Anton; and Kruger, Michael, 4,965,497, Cl. 318-372.000.

Heikkinen, Jukka: *See*—
Karna, Anssi; Heikkinen, Jukka; and Eskelinen, Juhani, 4,964,364, Cl. 118-410.000.

Hein, Alfred, to MHA Zentgraf Merziger Hochdruck-Armaturen GmbH & Co. Valve with rotary valving element. 4,964,436, Cl. 137-625.470.

Heinemann, Ulrich; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, to Bayer Aktiengesellschaft. Fungicidal 4-aza-1,10-phenanthroline derivatives. 4,965,265, Cl. 514-250.000.

Heisler, Mark: *See*—
Kraus, Menaham; Heisler, Mark; Katsnelson, Inessa; and Velazques, Diosie, 4,964,990, Cl. 210-490.000.

Heitmann, Walter: *See*—
Maetzel, Uwe; and Heitmann, Walter, 4,965,369, Cl. 548-492.000.

Helbig, Roland; and Trittler, Karl, to Hengstler GmbH. Pneumatic valve assembly for controlling a stream of compressed air. 4,964,424, Cl. 137-557.000.

Helleksen, Alden C.: *See*—
Veach, Jack R.; and Helleksen, Alden C., 4,964,376, Cl. 123-557.000.

Hellsten, Hans O. Method for radar mapping an area and a radar equipment to carry out the method. 4,965,582, Cl. 342-25.000.

Helmling, Oswald; Arnold, G.; Rzehak, H.; Fahey, George C., Jr.; Berger, Larry L.; Merchen, Neal R.; Medina, John; and Moerck, Rudi, to Degussa Aktiengesellschaft. Chemical-mechanical treatment of lignocellulosics to improve nutritive value. 4,965,086, Cl. 426-636.000.

Helms, Gayle A.: *See*—
Reis, Farrell L.; and Helms, Gayle A., 4,964,667, Cl. 296-95.100.

Hemmelgarn, Thomas L.: *See*—
Orr, Ladd; Raleigh, Freddie L.; and Hemmelgarn, Thomas L., 4,964,220, Cl. 33-503.000.

Hendricks, Udo W.; Sanders, Josef; and Tamer, Ergun, to Bayer Aktiengesellschaft. Process for after-treatment of dyed polyamide textile materials with polyurethane containing quaternary ammonium groups. 4,964,875, Cl. 8-442.000.

Hendrix, Machiel A. M.: *See*—
Van Meurs, Johannes M.; and Hendrix, Machiel A. M., 4,965,493, Cl. 315-224.000.

Hengstler GmbH: *See*—
Helbig, Roland; and Trittler, Karl, 4,964,424, Cl. 137-557.000.

Henkel Corporation: *See*—
Lewis, Roy G., 4,965,054, Cl. 423-112.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Jeschke, Peter; Kiewert, Eva; Nieendick, Claus; Nuesslein, Hans; and Sandkuehler, Peter, 4,965,014, Cl. 252-174.220.
Mueller, Heinz; Herold, Claus-Peter; and von Tapavicza, Stephan, 4,964,615, Cl. 252-8.551.
Schmid, Karl-Heinz; Meffert, Alfred; Schenker, Gilbert; Asbeck, Adolf; and Geke, Juergen, 4,965,019, Cl. 252-321.000.

Henry, James G. Automobile locator. 4,964,360, Cl. 116-28.00R.

Hensler, Thomas A.: *See*—
Gipson, William P.; Mason, Michael W.; and Hensler, Thomas A., 4,964,860, Cl. 604-391.000.

Henzel, Richard P., to Eastman Kodak Company. Thermal dye transfer receiving element with subbing layer for dye image-receiving layer. 4,965,238, Cl. 503-227.000.

Henzel, Richard P., to Eastman Kodak Company. Thermal dye transfer receiving element with subbing layer for dye image-receiving layer. 4,965,239, Cl. 503-227.000.

Henzel, Richard P.; and Harrison, Daniel J., to Eastman Kodak Company. Thermal dye transfer receiving element with subbing layer for dye image-receiving layer. 4,965,241, Cl. 503-227.000.

Heraeus Quarzschmelze GmbH: *See*—
Christiansen, Uwe, 4,964,227, Cl. 34-175.000.

Herbstman, Sheldon; and Virk, Kashmir S., to Texaco Inc. Middle distillate fuel containing deposit inhibitor. 4,964,879, Cl. 44-434.000.

Herchenroeder, Laurie A.; and Burkholder, Harvey R., to Iowa State University Research Foundation, Inc. Ion exchange purification of scandium. 4,965,053, Cl. 423-21.500.

Herlitzek, Andrea: *See*—
Von Basse, Paul-Werner; Dorta, Jean-Marc; Herlitzek, Andrea; Kohlert, Dieter; and Schaper, Ulrich, 4,965,464, Cl. 307-270.000.

Herman Hemscheidt Maschinenfrabrik GmbH & Co.: *See*—
Welzel, Josef, 4,964,675, Cl. 299-1.000.

Hermann, Reinhard, to Behringwerke Aktiengesellschaft. Process for obtaining active proteins from a biologically inactive form. 4,965,344, Cl. 530-351.000.

Hermanns, Ferdinand-Josef; and Haasen, Rolf, to W. Schlafhorst & Co. Method and apparatus for detecting the bobbin circumference of cross-wound bobbins and for utilizing the result. 4,964,582, Cl. 242-36.000.

Hermentin, Peter: *See*—
Kolar, Cenek; Paal, Michael; Hermentin, Peter; and Kraemer, Hans P., 4,965,352, Cl. 536-6.400.

Hernandez, Henry R.: *See*—
Solarek, Daniel B.; Dirscherl, Teresa A.; Hernandez, Henry R.; and Jarowenko, Wadym, 4,964,953, Cl. 162-175.000.

Herold, Claus-Peter: *See*—
Mueller, Heinz; Herold, Claus-Peter; and von Tapavicza, Stephan, 4,964,615, Cl. 252-8.551.

Herrick, Geoffrey C., to Tektronix, Inc. Apparatus for probing a microwave circuit. 4,965,514, Cl. 324-158.00P.

Herschman, George J.: *See*—
Christine, William C.; Lyons, Steffen; Posey, John; Schmidt, Josef; and Herschman, George J., 4,964,944, Cl. 156-515.000.

Hettinger, Peter: *See*—
Merger, Franz; Harder, Wolfgang; Hettinger, Peter; Priester, Claus-Ulrich; Franz, Dieter; and Voges, Dieter, 4,965,362, Cl. 546-246.000.

Heuscher, Dominic J.; and Mattson, Rodney A., to Picker International, Inc. CT scanner with segmented detector array. 4,965,726, Cl. 364-413.190.

Hewlett-Packard Company: *See*—
Elliott, Scott S.; Bray, Robert C.; Bagwell, Timothy L.; and Cross, Peter S., 4,965,479, Cl. 310-313.00D.
Hickman, Mark S., 4,965,593, Cl. 346-140.00R.
Pan, Alfred I.; and Hanson, Eric G., 4,965,611, Cl. 346-1.100.
Steranka, Frank M., 4,965,223, Cl. 437-127.000.
Sullivan, James J., 4,965,540, Cl. 333-227.000.
Thayer, Larry J.; and Coleman, Mark D., 4,965,751, Cl. 364-521.000.

Heybourne, Michael J. H.; Knight, Peter C.; Malguzzin, Antonio; Miotti, Daniele; and Travill, Andrew W., deceased (by May, Travill Rachel, legal representative), to Lever Brothers Company. Detergent composition and process for its production. 4,965,015, Cl. 252-174.250.

Heyden, Eguene L. Bag construction including easy-opening provision. 4,964,515, Cl. 206-632.000.

Heyland, Sven; Rolli, Karl; Roschli, David; and Sihver, Jaak J., to Nestec S.A. Preparation of a seasoning. 4,965,085, Cl. 426-533.000.

Hi-Tek Polymers, Inc.: *See*—
Russo, Donald P., 4,964,999, Cl. 252-8.551.

Hickman, John B.: *See*—
Braine, Mark D.; Kirby, Ralph; Schultz, Donald W.; Tuttle, Richard G.; Ferg, Nelson M.; Hickman, John B.; and Webb, William C., 4,964,248, Cl. 52-60.000.

Hickman, Mark S., to Hewlett-Packard Company. Print quality of dot printers. 4,965,593, Cl. 346-140.00R.

Hida, Yoshiaki: *See*—
Mizobuchi, Akira; Hida, Yoshiaki; Umise, Shigeki; Yamamoto, Kyoichi; and Takahashi, Kyohei, 4,965,132, Cl. 428-411.100.

Hietikko, Erkki: *See*—
Lamminen, Veikko; Hietikko, Erkki; and Kylmakorpi, Ilpo, 4,964,956, Cl. 162-203.000.

Higashimura, Hideaki: *See*—
Nokubo, Seiji; Kohno, Teruhisa; Hashida, Koichi; Matsumoto, Atsuo; and Higashimura, Hideaki, 4,964,680, Cl. 303-115.000.

High, Jarald E.: *See*—
Smith, Donald P.; Plumb, William W.; and High, Jarald E., 4,965,435, Cl. 219-388.000.

Hihi, Bachir. Light-source multiplication device. 4,965,488, Cl. 313-499.000.

Hijazi, Yousef. Space vehicle with collapsible living quarters. 4,964,597, Cl. 244-159.000.

Hill, Donald M.: *See*—
Weaver, John H.; Grasselli, Robert K.; Nelson, David L.; Meyer, Harry M., III; and Hill, Donald M., 4,965,244, Cl. 505-1.000.

Hill, James B., to Allegheny Ludlum Corporation. Ferritic stainless steel. 4,964,926, Cl. 148-325.000.

Hill, Trevor R.: *See*—
Okura, David K.; Gauthier, John A.; Hill, Trevor R.; and MacKenzie, Simon A., 4,965,884, Cl. 375-106.000.

Hillman, James M.: *See*—
Bachmann, Andrew G.; and Hillman, James M., 4,964,938, Cl. 156-273.700.

Hilton, Chester W. Catalytic heater for internal combustion engines. 4,964,797, Cl. 431-328.000.

Himmele, Walter: *See*—
Huellmann, Michael; Becker, Rainer; Lauterbach, Gerald; Buschmann, Ernst; Eckhardt, Heinz; Himmele, Walter; and Brueckner, Christiane, 4,965,376, Cl. 549-423.000.

Hines, Marshall U.: *See*—
Ball, Larry K.; and Hines, Marshall U., 4,964,422, Cl. 137-512.100.
Ball, Larry K.; Hines, Marshall U.; and Miller, Terry L., 4,964,431, Cl. 137-1.000.

Hink, Karl M.; and Polczynski, Mark H., to Thor Technology Corporation. Oximeter sensor assembly with integral cable. 4,964,408, Cl. 128-633.000.

Hinnant, John M.: *See*—
Garner, James D.; and Hinnant, John M., 4,964,754, Cl. 404-123.000.

Hioki, Chieko: *See*—
Santoh, Tsuyoshi; and Hioki, Chieko, 4,965,178, Cl. 430-495.000.

Hirahara, Takuji; Nakamura, Takashi; Kumeno, Yoshiko; Ohta, Takayuki; and Kasai, Tetsuo, to Mitsubishi Kasei Corporation. Thermoplastic polyester resin composition and molded articles produced therefrom. 4,965,302, Cl. 524-83.000.

Hiraishi, Shigetoshi; and Kabashima, Kazuo, to Mitsubishi Paper Mills, Ltd.; and Asahi Kasei Kogyo Kabushiki Kaisha. Thermal printing material. 4,965,237, Cl. 503-209.000.

Hiraka, Masahiro: *See*—
Nishino, Atsushi; Mizuno, Yasuo; Ikeda, Masaki; and Hiraka, Masahiro, 4,965,229, Cl. 501-14.000.

Hiramatsu, Teruo: *See*—
Yukumoto, Masao; Shibuya, Kiyoshi; Morito, Nobuyuki; and Hiramatsu, Teruo, 4,964,583, Cl. 242-56.00R.

Hirano, Bunzo. Heating furnaces. 4,964,799, Cl. 432-59.000.

Hirano, Masato: *See*—
Hirano, Mitsunori; Hirano, Masato; Yagihara, Morio; and Okada, Hisashi, 4,965,169, Cl. 430-264.000.

Hirano, Mitsunori; Hirano, Masato; Yagihara, Morio; and Okada, Hisashi, to Fuji Photo Film Co., Ltd. Method for forming a high contrast negative image. 4,965,169, Cl. 430-264.000.

Hirano, Sadayuki: *See*—
Murano, Katsuaki; Hirano, Sadayuki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 4,964,317, Cl. 74-844.000.

Hirao, Kenichi: *See*—
Takada, Takashi; and Hirao, Kenichi, 4,964,913, Cl. 106-808.000.

Hiraoka, Mizuho: *See*—
Imataki, Hiroyuki; Hiraoka, Mizuho; Ichikawa, Sachiko; Yoshino, Hitoshi; and Ogawa, Yoshihiro, 4,965,153, Cl. 430-11.000.

Hiroi, Masakazu; Naito, Masataka; and Murakami, Koichi, to Canon Kabushiki Kaisha. Sheet finisher with a binder. 4,965,629, Cl. 355-50.000.

Hirose Electric Co., Ltd.: *See*—
Kawai, Mitsuru; Yoshida, Masaru; and Sasaki, Yoshihiro, 4,964,815, Cl. 439-610.000.

Hirose, Masayuki: *See*—
Hata, Ryosuke; Yamanouchi, Shosuke; Hirose, Masayuki; Kuwabara, Hidemitsu; Mizumoto, Yasuharu; and Haginda, Yasuhiro, 4,964,933, Cl. 156-209.000.

Hirose, Toshifumi; Yukimoto, Sadao; and Isayama, Katsuhiko, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Curing composition having enhancing effect on drying characteristics of alkyd coating. 4,965,311, Cl. 524-483.000.

Hisadome, Masao: *See*—
Nakao, Toru; Morita, Kenji; Hisadome, Masao; and Takehara, Shuzo, 4,965,264, Cl. 514-248.000.

Hitachi Automotive Engineering Co., Ltd.: *See*—
Kameta, Katsunobu; Morita, Kiyomi; Kikuchi, Takeshi; and Tanabe, Yoshiyuki, 4,964,390, Cl. 123-489.000.

Hitachi Chemical Co., Ltd.: *See*—
Ogata, Masatsugu; Segawa, Tadanori; Abe, Hidetoshi; Suzuki, Shigeo; and Kawata, Tatsuo, 4,965,657, Cl. 357-72.000.

Hitachi Device Engineering Co., Ltd.: *See*—
Shirai, Shoji; Yamauchi, Masaaki; and Tanaka, Yasuo, 4,965,489, Cl. 313-449.000.

Hitachi Engineering Co., Ltd.: *See*—
Matsuo, Shigeru; Katsura, Koyo; Sato, Jun; Sone, Takashi; and Yokoyama, Masakatu, 4,965,750, Cl. 364-521.000.

Hitachi, Ltd.: *See*—
Baba, Shiro, 4,965,577, Cl. 341-141.000.
Etoh, Jun; Itoh, Kiyoo; Aoki, Masakazu; and Hori, Ryoichi, 4,965,769, Cl. 365-218.000.
Kameta, Katsunobu; Morita, Kiyomi; Kikuchi, Takeshi; and Tanabe, Yoshiyuki, 4,964,390, Cl. 123-489.000.
Koubuchi, Yasushi; Onuki, Jin; and Koizumi, Masahiro, 4,965,656, Cl. 357-71.000.
Mano, Hiroyuki; Kinugawa, Kiyoshige; and Tsunekawa, Satoru, 4,965,563, Cl. 340-784.000.
Matsuo, Shigeru; Katsura, Koyo; Sato, Jun; Sone, Takashi; and Yokoyama, Masakatu, 4,965,750, Cl. 364-521.000.
Nakano, Masaaki; Inoue, Tomoaki; Kawaike, Kazuhiko; Yamamoto, Yuji; and Ishikawa, Motoyuki, 4,964,740, Cl. 384-313.000.
Ogata, Masatsugu; Segawa, Tadanori; Abe, Hidetoshi; Suzuki, Shigeo; and Kawata, Tatsuo, 4,965,657, Cl. 357-72.000.
Ogihara, Satoru; Kodama, Hironori; Ushifusa, Nobuyuki; and Otsuka, Kanji, 4,965,660, Cl. 357-81.000.
Otsuka, Kanji; Kuroda, Shigeo; Sato, Katsuyuki; Nakamura, Hisashi; and Shouji, Shinichi, 4,965,653, Cl. 357-55.000.
Shirai, Shoji; Yamauchi, Masaaki; and Tanaka, Yasuo, 4,965,489, Cl. 313-449.000.
Tachikawa, Makoto; Suzuki, Osamu; Hashimoto, Tadahiko; Igari, Kuniyuki; and Katsuyama, Ichirou, 4,964,719, Cl. 353-85.000.
Tsuchida, Masami; Miyake, Ichiro; Takahashi, Tokihiro; Wakumura, Shinichi; Iso, Yoshimi; Arai, Takao; and Okamoto, Hiroo, 4,965,867, Cl. 341-118.000.
Ueda, Shigeta; Honda, Kazuo; Ikimi, Takashi; Matsuda, Toshihiko; Nagase, Hiroshi; and Mutoh, Nobuyoshi, 4,965,504, Cl. 318-802.000.
Yamauchi, Toshihiko; and Akiyama, Nobuyuki, 4,965,454, Cl. 250-372.000.
Yanagisawa, Kasumasa, 4,965,770, Cl. 365-238.500.

Hitachi Maxell Ltd.: *See*—
Fujiwara, Hideo, 4,965,687, Cl. 360-103.000.
Shinagawa, Tohru, 4,965,802, Cl. 371-51.100.

Hitachi VLSI Engineering Corp.: *See*—
Otsuka, Kanji; Kuroda, Shigeo; Sato, Katsuyuki; Nakamura, Hisashi; and Shouji, Shinichi, 4,965,653, Cl. 357-55.000.

Hnatuk, William. Tablet breaking apparatus. 4,964,555, Cl. 225-93.000.

Hoberg, Paul: *See*—
Bishop, Ronald D.; and Hoberg, Paul, 4,965,821, Cl. 379-91.000.

Hochstein, Peter A. Signal sensing circuit. 4,965,835, Cl. 381-110.000.

Hodogaya Chemical Company, Ltd.: *See*—
Hashimoto, Mitsuru; Shimada, Tomoyuki; Suzuki, Nobuo; Sakai, Takayuki; Suzuka, Susumu; and Sasaki, Masaomi, 4,965,157, Cl. 430-80.000.

Hoechst Aktiengesellschaft: *See*—
Bartlett, Robert R.; Schleyerbach, Rudolf; and Kammerer, Friedrich-Johannes, 4,965,276, Cl. 514-378.000.
Luft, Gerhard; and Trabold, Peter, 4,965,234, Cl. 502-154.000.
Muth, Gunter; Wohlleben, Wolfgang; Puhler, Alfred; Wohner, Gerhard; and Marquardt, Rudiger, 4,965,207, Cl. 435-320.000.

Hoechst Roussel Pharmaceuticals, Inc.: *See*—
Mandell, Gerald L.; Sullivan, Gail W.; and Novick, William J., 4,965,271, Cl. 514-263.000.

Hoehne, Dennis L.: *See*—
Heffner, Joseph H.; Seener, G. Thomas; and Hoehne, Dennis L., 4,964,567, Cl. 236-92.00B.

Hoeptner, Herbert W., to Custom Chrome, Inc. Foldable binoculars with enclosed side walls. 4,964,709, Cl. 350-546.000.

Hoever, Franz P.: *See*—
Kruger, Bernd W.; Sasse, Klaus; Lunkenheimer, Winfried; Hoever, Franz P.; Nentwig, Gunther; and Behrenz, Wolfgang, 4,965,286, Cl. 514-514.000.

Hoffmann, Frederic: *See*—
Mauleon, Jean-Louis; Siguad, Jean-Bernard; Pontier, Renaud; and Hoffmann, Frederic, 4,965,232, Cl. 502-43.000.

Hoffmann, Gottfried; Deutsch, Reinhard; and Symannek, Horst, to Korber AG. Apparatus for transferring layers of rod-shaped articles in packing machines. 4,964,501, Cl. 198-418.300.

Hoffmann-La Roche Inc.: *See*—
Beyeler, Paul; and Furbringer, Claude, 4,964,929, Cl. 149-109.600.
Felix, Arthur M.; Fournier, Alain; and Danho, Waleed, 4,965,343, Cl. 530-334.000.

Hoffrichter, Bernd; Pavelka, Bozidar; Pfefferkorn, Dietmar; Schaeffer, Norbert; and Goetz, Klaus, to BASF Aktiengesellschaft. Right parallelepiped cassette for tape-like recording media, and housing part thereof. 4,964,588, Cl. 242-199.000.

Hofmann, Franz, to Dr. Ing.h.c.F. Porsche AG. Top for vehicles, particularly passenger cars. 4,964,668, Cl. 296-107.000.

Hoganas AB: *See*—
Engstrom, Ulf; and Mustonen, Olavi, 4,964,909, Cl. 75-246.000.

HOH Water Technology Corp.: *See*—
O'Hare, Harry, 4,964,970, Cl. 204-301.000.

Hohimer, John P.: *See*—
Ashby, Carol I. H.; Hadley, G. Ronald; Hohimer, John P.; and Owyoung, Adelbert, 4,965,806, Cl. 372-45.000.

Holbrook, Gerald L.; and Leising, Maurice B., to Chrysler Corporation. Method of determining the shift lever position of an electronic automatic transmission system. 4,965,735, Cl. 364-424.100.

Holbrook, Gerald L.: *See*—
Benford, Howard L.; Leising, Maurice B.; and Holbrook, Gerald L., 4,964,506, Cl. 192-106.00F.

Hollingsworth, John D. Metallic card clothing. 4,964,195, Cl. 19-114.000.

Holloway, John C.; and Mallett, James A., to Joseph Pollak Corporation. Universal anti-lock brake switch linkage. 4,964,678, Cl. 303-91.000.

Hollowed, Edward J.; and Oldani, Jerome L., to GTE Airfone Incorporated. Pay station telephone and dispenser for a commercial conveyance. 4,965,824, Cl. 379-428.000.

Holmes, Paul; Nevin, Alan; Amstutz, Hermann; and Nehring, Jurgen, to Imperial Chemical Industries PLC; and BBC Brown Boveri Ltd. Liquid crystal devices. 4,965,017, Cl. 252-299.400.

Holtey, Thomas O.; Murray, Thomas L., Jr.; Perzan, Wayne A.; and Smith, Scott W., to Bull HN Information Systems Inc. Firmware state apparatus for controlling sequencing of processing including test operation in multiple data lines of communication. 4,965,721, Cl. 364-200.000.

Holtmyer, Marlin D.; and Hunt, Charles V., to Halliburton Company. Non-aqueous viscosified carbon dioxide and method of use. 4,964,467, Cl. 166-308.000.

Holzer, Heinrich; and Wagner, Hans-Dieter, to RCM Rubber Consulting & Machinery. Extruding device. 4,964,729, Cl. 366-75.000.

Homan, Howard S.: *See*—
Schilowitz, Alan M.; Shaub, Harold; Berlowitz, Paul J.; Homan, Howard S.; and Wigg, Eric E., 4,964,880, Cl. 44-341.000.

Homeyer, Bernhard: *See*—
Anderson, John; Homeyer, Bernhard; Kuhle, Engelbert; Scheinpflug, Hans; Zeck, Walter M.; and Simonet, Donald E., 4,965,254, Cl. 514-89.000.
Anderson, John; Homeyer, Bernhard; and Zeck, Walter M., 4,965,255, Cl. 514-128.000.
Anderson, John; Homeyer, Bernhard; and Zeck, Walter M., 4,965,256, Cl. 514-128.000.

Homma, Yoshiaki: *See*—
Murayama, Fumio; and Homma, Yoshiaki, 4,965,837, Cl. 381-186.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Bundo, Isao; Hannuki, Kouzou; and Ito, Mikiya, 4,964,497, Cl. 198-341.000.
Kubo, Kanji, 4,964,651, Cl. 280-690.000.
Sano, Shoichi; Furukawa, Yoshimi; and Hamada, Tetsuro, 4,964,481, Cl. 180-140.000.
Shizaki, Tomoo; Kawaguchi, Yoshiyuki; Nakano, Yasuhiko; Gotoda, Yusuke; and Takemura, Hiroo, 4,964,381, Cl. 123-73.00A.
Tanaka, Akira; Fukamachi, Masaaki; and Sakata, Kazuhiro, 4,965,460, Cl. 307-10.200.
Yokoyama, Masashi; and Hara, Naoki, 4,964,483, Cl. 180-219.000.

Honda, Kazuo: *See*—
Ueda, Shigeta; Honda, Kazuo; Ikimi, Takashi; Matsuda, Toshihiko; Nagase, Hiroshi; and Mutoh, Nobuyoshi, 4,965,504, Cl. 318-802.000.

Honda, Masaaki: *See*—
Miyamoto, Yoshinari; Yamada, Osamu; Koizumi, Mitsue; Komura, Osamu; Kamijo, Eiji; Honda, Masaaki; and Yamakawa, Akira, 4,965,044, Cl. 419-12.000.

Honda Motor Co., Ltd.: *See*—
Akiyama, Eitetsu; and Suzuki, Katsuhiko, 4,964,386, Cl. 123-339.000.

Honda, Satoshi: *See*—
Sakuso, Fumihiko; Sonoda, Hirofumi; Honda, Satoshi; and Kumagae, Ryouhei, 4,964,791, Cl. 425-8.000.

Honeywell, Inc.: *See*—
Hoschette, Arnold; Ellingboe, Jay M.; and Lubke, Allen, 4,965,453, Cl. 250-349.000.
Knecht, Harry L., 4,965,714, Cl. 364-187.000.
Morse, Paul G.; and Petty, Charles C., 4,965,448, Cl. 250-252.100.
Patton, Paul B.; and Kidder, Kenneth B., 4,965,755, Cl. 364-550.000.

Hong, Ing-Tsann; and Fitch, Ernest C., to Viking Pump Inc. Terminal element. 4,965,713, Cl. 364-149.000.

Hong, John H.; and McMichael, Lan C., to Rockwell International Corporation. Optical beamforming network for controlling an RF phased array. 4,965,603, Cl. 342-372.000.

Hoo, James W.: *See*—
Parshotam, Mahesh; Howard, Alan D.; Traulsen, Robert D.; Pennock, James L.; Hoo, James W.; and Masten, Michael M., 4,965,516, Cl. 324-158.00R.

Hoover, Thomas M., to Walbro Corporation. Check valve for engine fuel delivery systems. 4,964,391, Cl. 123-510.000.

Hoover, Thomas M., to Walbro Corporation. Electric vehicle pump isolation mount. 4,964,787, Cl. 417-363.000.

Hoover Universal, Inc.: *See*—
Rogala, Richard L.; and Tame, Omar D., 4,964,608, Cl. 248-429.000.

Hopkins, Webster D.: *See*—
Atalla, Martin M.; and Hopkins, Webster D., 4,965,568, Cl. 340-825.340.

Hoppner, Klaus: *See*—
Siede, Reinhard; Hoppner, Klaus; Weiss, Hermann; and Weissert, Wolfgang, 4,964,217, Cl. 30-383.000.

Hori, Masashi; and Yamagata, Shigeo, to Canon Kabushiki Kaisha. Method and apparatus for after-recording sound on a medium having pre-recorded video thereon. 4,965,675, Cl. 358-341.000.

Hori, Ryoichi: *See*—
Itoh, Jun; Itoh, Kiyoo; Aoki, Masakazu; and Hori, Ryoichi, 4,965,769, Cl. 365-218.000.

Hori, Taizou: *See*—
Nagasawa, Kenichi; and Hori, Taizou, 4,965,674, Cl. 358-341.000.

Hori, Toshio: *See*—
Sakamoto, Yukio; Tanabe, Takeshi; Fukutani, Iwao; and Hori, Toshio, 4,964,806, Cl. 439-79.000.

Horie, Shoichi: *See*—
Saeki, Kazumi; Inoue, Takeshi; and Horie, Shoichi, 4,965,395, Cl. 560-11.000.

Horikawa, Hideaki; and Akiyama, Masahiro, to Oki Electric Industry Co., Ltd. Process for fabricating an INP semiconductor thin film on silicon. 4,965,224, Cl. 437-132.000.

Horiuchi, Tohru, to Konica Corporation. Automatic loading camera with claw spool. 4,965,616, Cl. 354-212.000.

Horn, Glenn: *See*—
Mullis, Kary B.; Erlich, Henry A.; Gelfand, David H.; Horn, Glenn; and Saiki, Randall K., 4,965,188, Cl. 435-6.000.

Hornberger, David E.: *See*—
Guzzetta, Gerald J.; Hornberger, David E.; Guzzetta, Charles A.; and Schadt, Larry M., 4,964,759, Cl. 405-154.000.

Horner, Amos A.: *See*—
Edwards, Paul O.; Bolton, William E.; Hunter, Larry C.; and Horner, Amos A., 4,965,734, Cl. 364-474.090.

Horpel, Gerhard; and Pangratz, Joachim, to Bunawerke Huls GmbH. Process for deactivating polymerization-inducing radicals. 4,965,326, Cl. 526-84.000.

Horrobin, David F.; Cunnane, Stephen C.; and Manku, Mehar S., to Efamol Limited. Methods of increasing 1-series PGs in the body. 4,965,075, Cl. 424-638.000.

Horton, Roger L.: *See*—
Williams, Dennis A.; Newlove, John C.; and Horton, Roger L., 4,964,466, Cl. 166-300.000.

Horwell, David C.; and Rees, David C., to Warner-Lambert Company. 7-(substituted)amino)-8-((substituted)carbonyl)-methylamino)-1-oxaspiro[4,5]decanes as diuretics antiflammatory, and cerebrovascular agents. 4,965,278, Cl. 514-414.000.

Hoschette, Arnold; Ellingboe, Jay M.; and Lubke, Allen, to Honeywell, Inc. Multiple aperture ir sensor. 4,965,453, Cl. 250-349.000.

Hose, Hugh; Sozzi, Tomaso; and Wood, Robert D., to Nestec S.A. Acidified milk product of creamy consistency and process for making. 4,965,079, Cl. 426-43.000.

Hoshiko, Takeshi, to Junkosha Co., Ltd. Low permittivity composite material. 4,965,290, Cl. 521-54.000.

Hoshimiya, Nozomu: *See*—
Handa, Yasunobu; Hoshimiya, Nozomu; Oda, Takashi; and Tanimoto, Yoshinori, 4,964,414, Cl. 128-784.000.

Hosoe, Kazunori: *See*—
Kanoo, Fumihiko; Yamane, Takehiko; Kondo, Hideo; Hashizume, Takuji; Yamashita, Katsuji; Hosoe, Kazunori; Kuze, Fumiyuki; and Watanabe, Kiyoshi, 4,965,261, Cl. 514-229.500.

Hosoi, Masayuki: *See*—
Fukushima, Atsuhiko; Kashiwazaki, Takashi; Hosoi, Masayuki; and Ando, Hitoshi, 4,965,574, Cl. 340-995.000.

Hosoi, Noriyuki; and Usami, Toshimasa, to Fuji Photo Film Co., Ltd. Multicolor recording material. 4,965,166, Cl. 430-156.000.

Hosonuma, Masashi: *See*—
Shimamune, Takayuki; and Hosonuma, Masashi, 4,965,088, Cl. 427-2.000.

Hotomi, Hideo; Masaki, Kenji; Iino, Shuji; Osawa, Izumi; Fujiwara, Masanori; and Doi, Isao, to Minolta Camera Kabushiki Kaisha. Photosensitive member having an overcoat layer and process for manufacturing the same. 4,965,156, Cl. 430-66.000.

House, Randall; and Covarrubias, Jesse, to Randall House. Traffic barrier and method of construction. 4,964,750, Cl. 404-6.000.

Houston, Robert S. Gas tank container. 4,964,529, Cl. 220-402.000.

Howard, Alan D.: *See*—
Parshotam, Mahesh; Howard, Alan D.; Traulsen, Robert D.; Pennock, James L.; Hoo, James W.; and Masten, Michael M., 4,965,516, Cl. 324-158.00R.

Howard, Billy G., to Martin Sprocket and Gear. Two piece power transmission component. 4,964,842, Cl. 474-152.000.

Howard, Christopher A.: *See*—
Leahey, Edward; Zinner, Alexander J., III; and Howard, Christopher A., 4,964,410, Cl. 128-696.000.

Howard Hughes Medical Institute: *See*—
Woo, Savio L. C.; and Dilella, Anthony G., 4,965,190, Cl. 435-6.000.

Howard, James: *See*—
Lee, Neville K. S.; and Howard, James, 4,965,780, Cl. 369-13.000.

Howe, Varce E., to Ransburg Corporation. Automatic gain control fiber optica-to-electrical transceiver. 4,965,444, Cl. 250-205.000.

Hsieh, Chang-Ming: *See*—
Desilets, Brian H.; Hsieh, Chang-Ming; and Hsu, Louis L., 4,965,217, Cl. 437-32.000.

Hsterberg, William G.: *See*—
Donahue, Raymond J.; Hsterberg, William G.; and Cleary, Terrance M., 4,964,973, Cl. 204-64.00T.

Hsu, Jemin C., to Rohm and Haas Company. Synergistic microbicidal combinations containing 2-N-octyl-3-isothiazolone and certain commercial biocides. 4,964,892, Cl. 71-67.000.

Hsu, Louis L.: *See*—
Desilets, Brian H.; Hsieh, Chang-Ming; and Hsu, Louis L., 4,965,217, Cl. 437-32.000.

Huang, Ding S. Bustdart-free tailoring process for a fitted-waist dress to eliminate cutting of its backpiece. 4,964,177, Cl. 2-243.00B.

Huang, Hanchi: *See*—
Liu, Gang; Huang, Hanchi; Siy, Pepe; and Polis, Michael P., 4,965,579, Cl. 341-159.000.

Huang, Li-Hsii. Elastic clip with positioning means for positioning of perforations. 4,964,746, Cl. 402-25.000.

Hubbell, James C.; Stiller, Gordon L.; and Liegeois, David D., to Brunswick Corporation. Evaporable foam pattern for casting an air induction manifold. 4,964,454, Cl. 164-246.000.

Huck Manufacturing Company: *See*—
Kaelin, John J.; and Port, Gary L., 4,964,292, Cl. 72-453.170.

Hueil, J. Charles: *See*—
Crutcher, John P.; Hueil, J. Charles; and Juska, Donald D., 4,964,558, Cl. 227-8.000.

Huellmann, Michael; Becker, Rainer; Lauterbach, Gerald; Buschmann, Ernst; Eckhardt, Heinz; Himmele, Walter; and Brueckner, Christiane, to BASF Aktiengesellschaft. 3,9-dihydroxynonyne and its derivatives protected at the 9-OH function. 4,965,376, Cl. 549-423.000.

Huels Aktiengesellschaft: *See*—
Boeke, Burkhard; Kalka, Josef; and Winter, Hermann, 4,965,328, Cl. 526-212.000.

Huettenrauch, Gerd; and Schelschshorn, Herbert, to Siemens Aktiengesellschaft. Radiation guard means. 4,965,456, Cl. 250-515.100.

Hufford, Charles D.; and Clark, Alice M. Antimicrobial compound and compositions particularly effective against candida albicans. 4,965,272, Cl. 514-288.000.

Huggins, Raymond W., to Boeing Company, The. Multi-track analog optical sensing system and method. 4,964,727, Cl. 356-373.000.

Hughes Aircraft Company: *See*—
Clark, Robert T.; and Crist, Rick A., 4,965,527, Cl. 330-124.00R.
Cook, Lacy G., 4,964,706, Cl. 350-505.000.
Kahrilas, Peter J.; Miller, Thomas W.; and Lazzara, Samuel P., 4,965,602, Cl. 342-372.000.
Rogers, Howard H.; and Stadnick, Steven J., 4,965,145, Cl. 429-101.000.
Wong, Mon N.; and Kroupa, Gregory D., 4,965,868, Cl. 343-756.000.

Hughes, James D.; and Bailey, Bryan K. Extension for table saw. 4,964,450, Cl. 144-287.000.

Hull, Harold L.; and McCutcheon, John R. Portable horseshoe court. 4,964,644, Cl. 273-336.000.

Humes, Donald H.: *See*—
Kinard, William H.; Singer, S. Fred; Wortman, Jim J.; Humes, Donald H.; Kassel, Philip C., Jr.; and Stanley, John E., deceased, 4,964,300, Cl. 73-170.00R.

Hunt, Charles V.: *See*—
Holtmyer, Marlin D.; and Hunt, Charles V., 4,964,467, Cl. 166-308.000.

Hunter, Larry C.: *See*—
Edwards, Paul O.; Bolton, William E.; Hunter, Larry C.; and Horner, Amos A., 4,965,734, Cl. 364-474.090.

Huntron Instruments, Inc.: *See*—
Parshotam, Mahesh; Howard, Alan D.; Traulsen, Robert D.; Pennock, James L.; Hoo, James W.; and Masten, Michael M., 4,965,516, Cl. 324-158.00R.

Hurst, Michael J.: *See*—
Barham, Steven T.; and Hurst, Michael J., 4,965,830, Cl. 381-31.000.

Hurtubis, Edward F.: *See*—
Lioy, Daniel C.; Hurtubis, Edward F.; and Schickler, Edward R., 4,964,203, Cl. 29-121.800.

Hussain, Munir A., to Du Pont de Nemours, E. I., and Company. Intranasal administration of 3,3-disubstituted indolines. 4,965,066, Cl. 424-45.000.

Huston, John T., to Babcock & Wilcox Company, The. Maximum/-minimum asymmetric rod detection. 4,965,040, Cl. 376-236.000.

Huta Baildon Przedsiebiorstwo Panstwowe Katowice: *See*—
Karas, Wlodzimierz; Granowski, Robert; Ramotowski, Witold; Tuziemski, Aleksander; Cieplak, Jerzy; and Pilawski, Kazimierz, 4,964,403, Cl. 606-60.000.

Hutchings, David A.: *See*—
Saccocio, Edward J.; Varde, Uday; Hutchings, David A.; and Messer, Russell K., 4,965,165, Cl. 430-138.000.

Hutchinson: *See*—
Ciolczyk, Jean-Pierre; and Simon, Jean-Michel, 4,964,624, Cl. 267-31.000.

Hutchinson, Thomas D. Gelation of aluminum solutions using magnesium oxide. 4,965,228, Cl. 501-12.000.

Hutchison, Evan W.: *See*—
Ingram, Gaylynn F.; and Hutchison, Evan W., 4,964,512, Cl. 206-459.000.
Ingram, Gaylynn F.; and Hutchison, Evan W., 4,964,513, Cl. 206-459.000.

Hutchison, Jerry; Yang, Henry; and Hawe, William, to Digital Equipment Corporation. Network topology control method and apparatus. 4,965,791, Cl. 370-94.100.

Huttenberger, Michael; Kleineberg, Wolfgang; Schaal, Hans; Attinger, Thomas; and Dietz, Jurgen, to Daimler-Benz Aktiengesellschaft. Arrangement for accurately installing a replaceable reed switch of a device for monitoring the liquid level in a tank. 4,965,555, Cl. 340-624.000.

Hwang, Jei-Shoung: *See*—
Jeng, Bor-Shenn; Chang, Gan-How; Chang, Kuang-Yao; Liu, Jsann-Shyong; Lin, Jangkeng; Hwang, Jei-Shoung; Wu, T-Min; Shyu, Keh-Hwa; Miou, Char-Hin; and Can, Luke, 4,965,458, Cl. 364-419.000.

Hwang, Sang Yo: *See*—
Jung, Il Nam; Hwang, Sang Yo; and Bae, Hae Kyung, 4,965,385, Cl. 556-416.000.

Hydro Rene Leduc: *See*—
Porel, Louis C., 4,964,345, Cl. 105-96.100.

Hydrostress AG: *See*—
Bieri, Hans, 4,964,434, Cl. 137-567.000.

Hydrotechnik GmbH: *See*—
Wieser-Linhart, Johannes, 4,964,885, Cl. 55-8.000.

Hymanson, Bruce. Isokinetic oscillating exercise apparatus. 4,964,633, Cl. 272-125.000.

Hypeco AB: *See*—
Stenlund, Stig, 4,964,459, Cl. 165-119.000.

I.G. Bauerhin GmbH: *See*—
Altmann, Dieter; Haupt, Eberhard; and Knuppel, Manfred, 4,964,674, Cl. 297-180.000.

I. Sumitomo Electric Industries, Ltd.: *See*—
Miyamoto, Yoshinari; Yamada, Osamu; Koizumi, Mitsue; Komura, Osamu; Kamijo, Eiji; Honda, Masaaki; and Yamakawa, Akira, 4,965,044, Cl. 419-12.000.

Iatron Laboratories, Inc.: *See*—
Ogasawara, Minoru, 4,965,048, Cl. 422-54.000.

IBM: *See*—
Baker, Don L.; Gilda, Glenn D.; Quinn, Terrence A.; and Shaukatullah, Hussain, 4,964,737, Cl. 374-179.000.

Ibsen, Robert L.; and Glace, William R., to Den-Mat Corporation. Adhesive bonding of acrylic resins, especially in dentistry. 4,964,911, Cl. 106-35.000.

Ibuchi, Yoshiaki, to Sharp Kabushiki Kaisha. Image forming apparatus. 4,965,622, Cl. 355-27.000.

Ichikawa, Masahiko: *See*—
Yoshida, Hiroshi; Noguchi, Takeki; Ichikawa, Masahiko; Nakane, Takemi; Kubo, Kyoji; and Kinoshita, Kenichiro, 4,964,734, Cl. 374-14.000.

Ichikawa, Minoru; Kashiyama, Kotaro; and Furukawa, Tomomitsu, to Daido Metal Company. Distributor. 4,964,420, Cl. 137-171.000.

Ichikawa, Sachiko: *See*—
Imataki, Hiroyuki; Hiraoka, Mizuho; Ichikawa, Sachiko; Yoshino, Hitoshi; and Ogawa, Yoshihiro, 4,965,153, Cl. 430-11.000.

ICI Americas Inc.: *See*—
Hartmann, Ludwig A.; and Stephen, John F., 4,965,394, Cl. 558-425.000.
Teach, Eugene G., 4,965,368, Cl. 548-215.000.

Idexx Corporation: *See*—
Tonelli, Quentin J., 4,965,187, Cl. 435-5.000.

Iemura, Shigeru: *See*—
Ohigashi, Chiaki; Iemura, Shigeru; Shimamura, Kazuhiro; and Tanaka, Tetsuo, 4,965,597, Cl. 346-157.000.

Iftikar, Syed H.; and Mandish, John J., to Syquest Technology. Sealed removable cartridge for use with a high density disc drive with magnetic clutch. 4,965,691, Cl. 360-133.000.

Igari, Kuniyuki: *See*—
Tachikawa, Makoto; Suzuki, Osamu; Hashimoto, Tadahiko; Igari, Kuniyuki; and Katsuyama, Ichirou, 4,964,719, Cl. 353-85.000.

Ihata, Jyoji: *See*—
Shimamura, Yasuki; and Ihata, Jyoji, 4,965,322, Cl. 525-332.600.

IHC Holland N.V.: *See*—
Arentsen, Dik, 4,964,473, Cl. 173-1.000.

Iino, Shuji: *See*—
Hotomi, Hideo; Masaki, Kenji; Iino, Shuji; Osawa, Izumi; Fujiwara, Masanori; and Doi, Isao, 4,965,156, Cl. 430-66.000.

Iizuka, Hajime: *See*—
Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; and Nakano, Takuo, 4,965,263, Cl. 514-247.000.

Ijadi-Maghsoodi, Sina: *See*—
Barton, Thomas J.; and Ijadi-Maghsoodi, Sina, 4,965,332, Cl. 528-25.000.

Ijiri, Masaaki: *See*—
Katayama, Hideaki; Murakami, Toshifumi; Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; and Ijiri, Masaaki, 4,964,792, Cl. 425-32.000.

Ikeda, Masaki: *See*—
Nishino, Atsushi; Mizuno, Yasuo; Ikeda, Masaki; and Hiraka, Masahiro, 4,965,229, Cl. 501-14.000.

Ikeda, Masanori; Miura, Morikazu; and Aoshima, Atsushi, to Asahi Kasei Kogyo Kabushiki Kaisha. Fluoroepoxides and a process for production thereof. 4,965,379, Cl. 549-521.000.

Ikeda, Minoru; Ishii, Masaki; Ono, Hiroshi; and Saito, Koichi, to Kuraray Company, Ltd. Optical recording medium. 4,965,114, Cl. 428-64.000.

Ikeda, Shinji: *See*—
Yasaki, Toshio; Maehata, Shigeki; Satoh, Tomoko; and Ikeda, Shinji, 4,965,354, Cl. 536-124.000.

Ikeda, Takashi; Takagishi, Hisao; and Saka, Terumasa, to Sumitomo Chemical Company, Limited. Process for resin finishing fabrics. 4,964,872, Cl. 8-115.660.

Ikegawa, Akihiko: *See*—
Kubodera, Seiiti; Ikegawa, Akihiko; and Okazaki, Masaki, 4,965,181, Cl. 430-550.000.

Ikeno, Yoshimitsu: *See*—
Sugimoto, Masaru; Kohno, Osamu; Ikeno, Yoshimitsu; Sadakata, Nobuyuki; Nakagawa, Mikio; Aoki, Shin'ya; Tan, Masayuki; Okiai, Ryuichi; Yoshida, Syotaro; Hasegawa, Masakazu; and Yamanouchi, Hiroshi, 4,965,245, Cl. 505-1.000.

Ikenoue, Yoshikazu: *See*—
Morikawa, Takashi; and Ikenoue, Yoshikazu, 4,965,771, Cl. 364-900.000.

Ikeuchi, Masayuki; and Okamura, Koichi, to Mitsubishi Denki Kabushiki Kaisha. Rotation angle detector with outwardly extending radial projections. 4,965,445, Cl. 250-231.130.

Ikimi, Takashi: *See*—
Ueda, Shigeta; Honda, Kazuo; Ikimi, Takashi; Matsuda, Toshihiko; Nagase, Hiroshi; and Mutoh, Nobuyoshi, 4,965,504, Cl. 318-802.000.

Illinois Tool Works Inc.: *See*—
Lat, Geronimo E.; and Gabriel, Willaim L., 4,964,774, Cl. 411-446.000.

Im, Jang-hi; Maugans, Rexford A.; and Kiesel, David R., to Dow Chemical Company, The. Multilayer film with dead fold and twistability characteristics. 4,965,135, Cl. 428-412.000.

Imasa Limited: *See*—
Jackson, Brian; and Barnett, Gary, 4,964,920, Cl. 134-3.000.

Imataki, Hiroyuki; Hiraoka, Mizuho; Ichikawa, Sachiko; Yoshino, Hitoshi; and Ogawa, Yoshihiro, to Canon Kabushiki Kaisha. Optical recording medium. 4,965,153, Cl. 430-11.000.

Imbiex (Monmouth) Limited: *See*—
Yair, John, 4,964,603, Cl. 248-230.000.

Imi-Tech Corporation: *See*—
Ferro, Gregory A., 4,964,936, Cl. 156-242.000.

Immunex Corp.: *See*—
Namen, Anthony E.; Goodwin, Raymond G.; Lupton, Stephen D.; and Mochizuki, Diane Y., 4,965,195, Cl. 435-69.520.

Imoto, Kazunobu, to Dai Nippon Insatsu Kabushiki Kaisha. Image-receiving sheet. 4,965,240, Cl. 503-227.000.

Imperial Chemical Industries PLC: *See*—
Allen, Simon; Gordon, Paul F.; and Morley, John O., 4,965,020, Cl. 252-587.000.
Holmes, Paul; Nevin, Alan; Amstutz, Hermann; and Nehring, Jurgen, 4,965,017, Cl. 252-299.400.

Imura, Akihiro: *See*—
Inoue, Hideo; Ohtsuka, Eiko; Imura, Akihiro; Masuda, Kenichi; and Kamimura, Takashi, 4,965,350, Cl. 536-28.000.

Inada, Masanori; Eda, Kazuo; Ota, Yorito; Nakagawa, Atsushi; and Yanagihara, Manabu, to Matsushita Electric Industrial Co., Ltd. Bipolar transistor and method of producing the same. 4,965,650, Cl. 357-34.000.

Inage, Masaru: *See*—
Takamura, Norio; Inoue, Isao; Inage, Masaru; Yamaguchi, Isao; and Yano, Koji, 4,965,282, Cl. 514-406.000.

Inai, Toshimi; and Motoi, Koji, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Method for coating a metal substrate by the use of a resin composition. 4,965,102, Cl. 427-374.400.

Inax Corporation: *See*—
Nakajima, Hirohito; Ito, Takaaki; and Muraguchi, Yukito, 4,965,230, Cl. 501-128.000.

Incrediball, Inc.: *See*—
Boyer, Ralph, 4,964,634, Cl. 273-26.00E.

Industrie Pinifarina S.p.A.: *See*—
Dogliani, Enrico, 4,964,670, Cl. 296-136.000.

Ingram, Gaylynn F.; and Hutchison, Evan W., to Eastman Kodak Company. Recyclable package. 4,964,512, Cl. 206-459.000.

Ingram, Gaylynn F.; and Hutchison, Evan W., to Eastman Kodak Company. Package. 4,964,513, Cl. 206-459.000.

Inland Container Corporation: *See*—
Whelan, Harry I., 4,964,561, Cl. 229-102.000.

INorddeutsche Industrie Christiansen & Co.(GmbH & Co.): *See*—
Jurissen, Gunter; and Eichler, Angelika, 4,964,884, Cl. 51-295.000.

Inoue, Hideo; Ohtsuka, Eiko; Imura, Akihiro; Masuda, Kenichi; and Kamimura, Takashi, to Teijin Limited. Pyridopyrimidine nucleotide compounds. 4,965,350, Cl. 536-28.000.

Inoue, Hiroshi, to Canon Kabushiki Kaisha. Display device. 4,964,699, Cl. 350-332.000.

Inoue, Isao: *See*—
Takamura, Norio; Inoue, Isao; Inage, Masaru; Yamaguchi, Isao; and Yano, Koji, 4,965,282, Cl. 514-406.000.

Inoue, Kunitoshi; Kawaguchi, Shigeru; and Nomoto, Kazuhiro, to Nippon Gasket Co., Ltd. Method of manufacturing metallic gaskets. 4,964,293, Cl. 72-379.200.

Inoue, Makoto: *See*—
Watarai, Shinichi; Inoue, Makoto; and Ohyabu, Keiji, 4,965,640, Cl. 355-283.000.

Inoue, Takeo: *See*—
Inouye, Yoshio; Inoue, Takeo; and Yokoo, Koji, 4,965,333, Cl. 528-33.000.

Inoue, Takeshi: *See*—
Ohnishi, Osamu; Takahashi, Sadayuki; Myohga, Osamu; Uchikawa, Tadao; Inoue, Takeshi; Kagaya, Isao; and Ueha, Sadayuki, 4,965,482, Cl. 310-323.000.
Saeki, Kazumi; Inoue, Takeshi; and Horie, Shoichi, 4,965,395, Cl. 560-11.000.

Inoue, Teruichi: *See*—
Kagawa, Akinobu; Inoue, Teruichi; Kametani, Masaru; and Nakamura, Koji, 4,964,742, Cl. 384-515.000.

Inoue, Tomoaki: *See*—
Nakano, Masaaki; Inoue, Tomoaki; Kawaike, Kazuhiko; Yamamoto, Yuji; and Ishikawa, Motoyuki, 4,964,740, Cl. 384-313.000.

Inouye, Yoshio; Inoue, Takeo; and Yokoo, Koji, to Shin-Etsu Chemical Co., Ltd. RTV organopolysiloxane compositions. 4,965,333, Cl. 528-33.000.

Insley, Thomas I.; Dyrud, James F.; and Young, Donald E., to Minnesota Mining and Manufacturing Co. Universal shipping container for hazardous liquids. 4,964,509, Cl. 206-204.000.

Institut Francais du Petrole: *See*—
Lefebvre, Claude, 4,964,388, Cl. 123-435.000.
Mauleon, Jean-Louis; Siguad, Jean-Bernard; Pontier, Renaud; and Hoffmann, Frederic, 4,965,232, Cl. 502-43.000.

Institut Merieux: *See*—
Quentin-Millet, Marie-Jose B.; Arminjon, Francois; and Donikian, Roupen R., 4,965,205, Cl. 435-252.000.

Integram Inc.: *See*—
Ubelacker, Horst; Storch, Helmut; and Buchwald, Peter, 4,964,794, Cl. 425-117.000.

Intel Corporation: *See*—
Keith, Michael, 4,965,752, Cl. 364-522.000.

Interand Corporation: *See*—
Saki, Yosinori; Kotera, Hiroshi; Unemoto, Kazuo; Arikawa, Tomohiko; Jung, Wayne; Tutt, Timothy; and Dunk, Mike, 4,965,558, Cl. 340-712.000.

Intermedics, Inc.: *See*—
Baker, Ross G., Jr.; and Vandegriff, Joseph W., 4,964,407, Cl. 128-419.0PG.

Intermedics Orthopedics, Inc.: *See*—
Burkhead, Wayne Z.; Dale, James L.; and Burkinshaw, Brian D., 4,964,865, Cl. 623-19.000.

InterMetro Industries Corporation: *See*—
Kolvites, Albert; Cohn, Robert J.; Welsch, John H.; Sickles, Willard J.; and Balazek, David T., 4,964,350, Cl. 108-110.000.

International Business Machines Corporation: *See*—
Bottau, Francoise; Galand, Claude; and Rosso, Michele, 4,965,789, Cl. 370-79.000.
Brown, Max R., 4,965,765, Cl. 364-900.000.
Daniel, Arthur A.; and Moore, Robert E., 4,965,772, Cl. 364-900.000.
DeBar, David E.; and Shah, Indravadan J., 4,965,512, Cl. 324-103.00P.

Desilets, Brian H.; Hsieh, Chang-Ming; and Hsu, Louis L., 4,965,217, Cl. 437-32.000.
Duspiva, Walter S.; Gillett, John B.; and Spreen, James H., 4,965,712, Cl. 363-126.000.
Flint, Ephraim B.; Grebe, Kurt R.; Gruber, Peter A.; and Zingher, Arthur R., 4,964,458, Cl. 165-80.400.
George, David A.; and Rathi, Bharat D., 4,965,718, Cl. 364-200.000.
Karner, Friedrich A.; Phelps, Douglas W., Jr.; Starr, Stephen G.; and Ward, William C., 4,965,654, Cl. 357-70.000.
Magdo, Ingrid E.; and Magdo, Steven, 4,965,652, Cl. 352-50.000.
McBride, Donald G., 4,965,700, Cl. 361-398.000.
Mitchell, Glen R.; Mustain, Richard G.; Peterson, Jon H.; and Whitley, Lawrence D., 4,965,720, Cl. 364-200.000.
Pennebaker, William B.; Anderson, Karen L.; and Mitchell, Joan L. V., 4,965,677, Cl. 358-429.000.
Shoens, Kurt A.; and Treiber, Richard K., 4,965,719, Cl. 364-200.000.
Solomon, Paul M., 4,965,645, Cl. 357-22.000.
Sweeney, Michael A., 4,965,716, Cl. 364-200.000.
Zamora, Elena M., 4,965,763, Cl. 364-900.000.

International Packaging Corporation: *See*—
Kilmartin, John D., III, 4,964,520, Cl. 211-131.000.

International Paper Co.: *See*—
Gordon, Robert L., 4,964,562, Cl. 229-125.150.

International Rectifier Corporation: *See*—
Gould, Herbert J., 4,965,173, Cl. 430-317.000.
Pelly, Brian R.; Dubhashi, Ajit; and Ewer, Peter R., 4,965,710, Cl. 363-56.000.

Ion Track Instruments: *See*—
Jenkins, Anthony, 4,964,309, Cl. 73-864.810.
Jenkins, Anthony, 4,964,309, Cl. 73-864.810.

Iovine, John. Holographic image recording using liquid crystal. 4,964,684, Cl. 350-3.760.

Iowa State University Research Foundation, Inc.: *See*—
Barton, Thomas J.; and Ijadi-Maghsoodi, Sina, 4,965,332, Cl. 528-25.000.
Herchenroeder, Laurie A.; and Burkholder, Harvey R., 4,965,053, Cl. 423-21.500.
Kraus, George A.; and Reynolds, Donald L., 4,965,267, Cl. 514-253.000.

Ippolito, Robert: *See*—
O'Donovan, Robert; and Ippolito, Robert, 4,964,551, Cl. 224-32.00A.

Ipri, Alfred C.; and Stewart, Roger G., to General Electric Company. Thin film transistor and crossover structure for liquid crystal displays. 4,965,646, Cl. 357-23.700.

Isaka, Kazuo: *See*—
Kurabayashi, Yutaka; Ohnishi, Toshikazu; Yoshinaga, Kazuo; Mouri, Akihiro; Isaka, Kazuo; Kaneko, Shuzo; Eguchi, Takeo; and Toshida, Yomishi, 4,965,591, Cl. 346-108.000.

Isaksen, Robert A.: *See*—
Jones, Wallace R.; Isaksen, Robert A.; and Krieger, Paul A., 4,965,113, Cl. 428-40.000.

Isayama, Katsuhiko: *See*—
Hirose, Toshifumi; Yukimoto, Sadao; and Isayama, Katsuhiko, 4,965,311, Cl. 524-483.000.

Isco, Inc.: *See*—
Allington, Robert W.; Curran, Jon L.; and Schmidt, Jerold B., 4,964,533, Cl. 222-14.000.

ISG/AG: *See*—
Larsson, Karl O. A. H., 4,964,851, Cl. 604-74.000.

Ishida, Naomi, to Kabushiki Kaisha Universal. Control apparatus for game machines. 4,964,638, Cl. 273-138.00A.

Ishii, Katsumi: *See*—
Uno, Hitoshi; Kon, Tatsuya; Nishikawa, Yoshinori; Shindo, Tokuhiko; Nakamura, Hideo; and Ishii, Katsumi, 4,965,266, Cl. 514-253.000.

Ishii, Masaki: *See*—
Ikeda, Minoru; Ishii, Masaki; Ono, Hiroshi; and Saito, Koichi, 4,965,114, Cl. 428-64.000.

Ishikawa, Masao; and Kuse, Satoru, to Konica Corporation. Method for processing light-sensitive silver halide color photographic material. 4,965,176, Cl. 430-378.000.

Ishikawa, Motoyuki: *See*—
Nakano, Masaaki; Inoue, Tomoaki; Kawaike, Kazuhiko; Yamamoto, Yuji; and Ishikawa, Motoyuki, 4,964,740, Cl. 384-313.000.

Ishikawa, Shigeki: *See*—
Sakakibara, Kenji; Ueda, Masashi; Ishikawa, Shigeki; Sakai, Jun; and Izaki, Takeshi, 4,965,625, Cl. 355-35.000.

Ishikawa, Takatoshi, to Alps Electric Co., Ltd. Ink-jet recording method. 4,965,610, Cl. 346-1.100.

Ishiwatari, Kiyokazu; Hamada, Yoshitsugu; and Yamada, Osamu, to Showa Denko Kabushiki Kaisha. Method of preforming a cover member of a can-shaped container. 4,965,035, Cl. 264-268.000.

Ishizuka, Kiminori, to Kabushiki Kaisha Toshiba. Recorder with dual mode operation. 4,965,614, Cl. 346-34.000.

Iso, Yoshimi: *See*—
Tsuchida, Masami; Miyake, Ichiro; Takahashi, Tokihiro; Wakumura, Shinichi; Iso, Yoshimi; Arai, Takao; and Okamoto, Hiroo, 4,965,867, Cl. 341-118.000.

Isoda, Satoru: *See*—
Ueyama, Satoshi; and Isoda, Satoru, 4,965,133, Cl. 428-411.100.

Isoda, Takeshi: *See*—
Funayama, Osamu; Arai, Mikiro; Nishii, Hayato; and Isoda, Takeshi, 4,965,058, Cl. 423-325.000.

Isono, Osamu: *See*—
Nishino, Tetsuo; Isono, Osamu; Tachibana, Tetsuo; Iwabuchi, Eisuke; and Fukui, Toshimasa, 4,965,790, Cl. 370-85.120.

Isover Saint-Gobain: *See*—
Debouzie, Alain; Bouquet, Francois; and De Meringo, Alain, 4,964,978, Cl. 264-119.000.

Isozaki, Osamu: *See*—
Nakai, Noboru; Isozaki, Osamu; and Midogohchi, Susumu, 4,965,312, Cl. 524-506.000.

Itako, Eiji: *See*—
Nishiumi, Kenji; Kassara, Toru; Mori, Yoshikazu; and Itako, Eiji, 4,964,517, Cl. 209-534.000.

Itameri-Kinter, Terry; Sauerbrey, David W.; and Troia, Victor, to Tecumseh Products Company. Hermetic terminal with terminal pin assemblies having fusible links and motor compressor unit including same. 4,964,788, Cl. 417-422.000.

Ito, Akio: *See*—
Kawajiri, Shogo; Ito, Akio; and Yamamoto, Katsumi, 4,964,294, Cl. 73-35.000.

Ito, Hiroshi: *See*—
Handa, Jun-ichi; Ito, Hiroshi; and Minohara, Taketoshi, 4,965,098, Cl. 428-203.000.

Ito, Masaji: *See*—
Ogura, Masaaki; Ohta, Kiyotaka; Kurokawa, Junji; Ito, Masaji; and Hayasaka, Toshiaki, 4,965,871, Cl. 355-55.000.

Ito, Mikiya: *See*—
Bundo, Isao; Hannuki, Kouzou; and Ito, Mikiya, 4,964,497, Cl. 198-341.000.

Ito, Shinzo: *See*—
Kaneko, Yasuhiro; and Ito, Shinzo, 4,965,841, Cl. 382-1.000.

Ito, Takaaki: *See*—
Nakajima, Hirohito; Ito, Takaaki; and Muraguchi, Yukito, 4,965,230, Cl. 501-128.000.

Itoh, Junichi: *See*—
Yamasaki, Masafumi; Toyofuku, Toshiyuki; Itoh, Junichi; and Kodama, Shinichi, 4,965,443, Cl. 250-201.700.

Itoh, Kiyoo: *See*—
Etoh, Jun; Itoh, Kiyoo; Aoki, Masakazu; and Hori, Ryoichi, 4,965,769, Cl. 365-218.000.

ITT Corporation: *See*—
Geissberger, Arthur E.; Sadler, Robert A.; Luper, Paulette; and Balzan, Matthew L., 4,965,218, Cl. 437-41.000.

IVAC Corporation: *See*—
Vyse, Tom, 4,965,446, Cl. 250-231.140.

Iwabuchi, Eisuke: *See*—
Nishino, Tetsuo; Isono, Osamu; Tachibana, Tetsuo; Iwabuchi, Eisuke; and Fukui, Toshimasa, 4,965,790, Cl. 370-85.120.

Iwagaya, Takashi, to Fanuc Ltd. Numerical control apparatus providing high-speed distribution data. 4,965,737, Cl. 364-474.220.

Iwama, Akio: *See*—
Shimatani, Shunichi; Yamamoto, Michiharu; Shimazu, Akira; and Iwama, Akio, 4,964,887, Cl. 55-16.000.

Iwasa, Hitoo: *See*—
Kawabata, Toshiharu; Koike, Susumu; Matsuda, Toshio; and Iwasa, Hitoo, 4,965,644, Cl. 357-17.000.

Iwasaki, Hiroshi, to Kabushiki Kaisha Toshiba. Method of manufacturing a semiconductor integrated circuit device comprising an MOS transistor and a bipolar transistor. 4,965,220, Cl. 437-59.000.

Izaki, Takeshi: *See*—
Sakakibara, Kenji; Ueda, Masashi; Ishikawa, Shigeki; Sakai, Jun; and Izaki, Takeshi, 4,965,625, Cl. 355-35.000.

Izumi, Hideo: *See*—
Nobutani, Tohru; Nakamoto, Atsuhiro; Izumi, Hideo; and Miyano, Takahiro, 4,964,962, Cl. 204-192.300.

J.H. Benecke AG and Corovin GmbH: *See*—
Mente, Kurt; and Knitsch, Gerhard, 4,964,197, Cl. 19-299.000.

Jackson, Brian; and Barnett, Gary, to Imasa Limited. Method of removing deposits of tin, lead or tin/lead alloys from copper substrates and compositions for use therein. 4,964,920, Cl. 134-3.000.

Jackson, Lawrence B. Shaft alignment apparatus. 4,964,224, Cl. 33-645.000.

Jackson, Roy J.; and Pigneri, Anthony M., to Shell Oil Company. Curable resin compositions. 4,965,331, Cl. 526-262.000.

Jacobsen, Stephen C.; and Wood, John E., to Sarcos Group. Field-based movement sensor. 4,964,306, Cl. 73-763.000.

Jacquet, Jean-Pierre: *See*—
Weber, Abraham; Bouzard, Daniel; Essiz, Munir; Di Cesare, Pierre; Jacquet, Jean-Pierre; and Remuzon, Philippe, 4,965,273, Cl. 514-300.000.

Jadrich, Bradley S.; and Wakefield, Edward H., to Eastman Kodak Company. Film clamp. 4,965,632, Cl. 355-76.000.

James, John: *See*—
Carr, Thomas G.; Oliver, Donald; James, John; and Rayfield, Robert, 4,964,804, Cl. 434-219.000.

Jameson, Graeme W.: *See*—
Van Leeuwen, Hendrikus J.; Freeman, Norman H.; Sutherland, Brian J.; and Jameson, Graeme W., 4,965,078, Cl. 424-40.000.

Janicki, Michael J.: *See*—
Reeder, Gary D.; and Janicki, Michael J., 4,964,984, Cl. 210-188.000.

Janiel, Peter A.: *See*—
Gartner, Georg F.; Janiel, Peter A.; and Lydtin, Hans-Jurgen, 4,965,090, Cl. 427-39.000.

Janis, William F. Walking aid ice gripper. 4,964,430, Cl. 135-78.000.

Janssen, Robert A., to Ciba-Geigy Corporation. Process for hydroxylating hydrophobic polymer surfaces. 4,965,026, Cl. 264-22.000.

Jarowenko, Wadym: *See*—
Solarek, Daniel B.; Dirscherl, Teresa A.; Hernandez, Henry R.; and Jarowenko, Wadym, 4,964,953, Cl. 162-175.000.
Jay, Jeffrey L., to Scherping Systems, Inc. Apparatus for processing cheese. 4,964,334, Cl. 99-459.000.
Jeffcoat, Roger: *See*—
Casey, John; Dobb, Roy T.; and Jeffcoat, Roger, 4,965,201, Cl. 435-134.000.
Jeng, Bor-Shenn; Chang, Gan-How; Chang, Kuang-Yao; Liu, Jsann-Shyong; Lin, Jangkeng; Hwang, Jei-Shoung; Wu, T-Min; Shyu, Keh-Hwa; Miou, Char-Hin; and Can, Lake, to Telecommunication Laboratories, Directorate General of Telecommunications, Ministry of Communications. Apparatus for translating oracle-bone scripture into a more formal language. 4,965,458, Cl. 364-419.000.
Jeng, Tina: *See*—
Ejiri, Koichi; Jeng, Tina; Roth, Rithy; and Lam, Lak M., 4,965,676, Cl. 358-406.000.
Jenkins, Anthony, to Ion Track Instruments; and Ion Track Instruments. Portal vapor detection system. 4,964,309, Cl. 73-864.810.
Jenkner, Erwin. Apparatus for sorting, stacking and conveying plate workpieces. 4,964,781, Cl. 414-790.700.
Jensen, Jay E., to Mobil Oil Corporation. Method and apparatus for detecting liquid leaks. 4,964,296, Cl. 73-49.200.
Jermyn, Arthur C. Device for handling a plastic contact lens. 4,964,663, Cl. 294-1.200.
Jeroudi, Louay: *See*—
Bieltvedt, Arnor; Jeroudi, Louay; Andersson, Lena; and Agustsson, Sigurdur, 4,964,523, Cl. 220-1.00T.
Jeschke, Peter; Kiewert, Eva; Nieendick, Claus; Nuesslein, Hans; and Sandkuehler, Peter, to Henkel Kommanditgesellschaft auf Aktien. Liquid nonionic surfactant mixtures. 4,965,014, Cl. 252-174.220.
Jessop, Paul M., to Ballard Medical Products. Adaptation of pipetter. 4,965,050, Cl. 422-100.000.
Jewett, Douglas E.: *See*—
Cutts, Richard W., ; Mehta, Nikhil A.; and Jewett, Douglas E., 4,965,717, Cl. 364-200.000.
Jihad, Dakka; Amikam, Zoran; and Sasson, Yoel, to Gadot Petrochemical Industries, Inc.; and Yissum Research Development Company of the Hebrew University of Jerusalem. Process for the manufacture of benzoic acid and salts thereof. 4,965,406, Cl. 562-414.000.
Jinnai, Shigeru; and Fukushima, Nobuo, to Canon Kabushiki Kaisha. Speed control device. 4,965,682, Cl. 360-73.030.
Jobson, Ian, to AMP Incorporated. Electrical test equipment. 4,964,809, Cl. 439-357.000.
Jochi, Takashi, to Miyachi Electronic Company. Capacitor type welding power unit. 4,965,860, Cl. 219-113.000.
Johansson, Hans, to Eka Nobel AB. Process for the production of paper. 4,964,954, Cl. 162-164.600.
John Fluke Mfg. Co., Inc.: *See*—
Epperson, David L., 4,965,421, Cl. 200-514.000.
John, Thomas: *See*—
Bock, Georg; Gollinger, Franz X.; and John, Thomas, 4,964,336, Cl. 101-157.000.
Johns Hopkins University, The: *See*—
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Johnson, Alfred D., to TiNi Alloy Company. Shape memory alloy rotary actuator. 4,965,545, Cl. 337-140.000.
Johnson, Cortlandt E.: *See*—
Olliver, Richard; Johnson, Cortlandt E.; and Patton, David L., 4,965,628, Cl. 355-41.000.
Johnson, Daniel L.: *See*—
Hayes, Earl J., Sr.; Johnson, Daniel L.; and Martin, Galen M., 4,964,811, Cl. 439-398.000.
Johnson, Michael T.; and Kipnis, Alexander, to Empi, Inc. Evoked EMG signal processing. 4,964,411, Cl. 128-733.000.
Johnson Service Company: *See*—
Kautz, Thomas O., 4,965,475, Cl. 310-13.000.
Thoma, Paul E.; and Colla, Jeannine O., 4,965,698, Cl. 361-286.000.
Johnson & Wales University: *See*—
Bieltvedt, Arnor; Jeroudi, Louay; Andersson, Lena; and Agustsson, Sigurdur, 4,964,523, Cl. 220-1.00T.
Johnson, Willard L. Cross flow filter apparatus. 4,964,987, Cl. 210-332.000.
Jones, James S., to Ward, David. Carburetor having bidirectional fuel passage. 4,965,023, Cl. 261-34.200.
Jones, John W. Garage parking guide. 4,965,571, Cl. 340-932.200.
Jones, Letha L. Shampoo or massage device. 4,964,398, Cl. 128-51.000.
Jones, Richard L., to Conoco Inc. Hot melt coatings made from a novel petroleum wax. 4,965,305, Cl. 524-349.000.
Jones, Richard L., to Conoco Inc. Process for producing hot melt wax compositions. 4,965,306, Cl. 524-351.000.
Jones, Robert S.; and Maurer, John J., to Eastman Kodak Company. Compact light collimator for a scanning contact printer. 4,965,621, Cl. 355-1.000.
Jones, Wallace R.; Isaksen, Robert A.; and Krieger, Paul A., to Excello Specialty Company, The. Transfer adhesive sandwich and method of applying adhesive to substrates. 4,965,113, Cl. 428-40.000.
Jorden, Ralph Z.; and Lesig, Ronald S., to Magnavox Government and Industrial Electronics Company. Circuit card assembly cold plate. 4,965,699, Cl. 361-387.000.
Jose, Horst-Udo: *See*—
Ruggeberg, Klaus; and Jose, Horst-Udo, 4,965,105, Cl. 428-34.200.
Joseph, Philippe, to S.A.M.M.-Societe d'Applications des Machines Motrices. Damper for a hydropneumatic suspension element of a vehicle, and in particular a heavy vehicle. 4,964,492, Cl. 188-299.000.
Joseph Pollak Corporation: *See*—
Holloway, John C.; and Mallett, James A., 4,964,678, Cl. 303-91.000.
Joshi, Vasant M. Reciprocating piston internal combustion engines and like machines. 4,964,374, Cl. 723-197.0AB.
Julien, Paul C.: *See*—
Gruber, Robert J.; Yourd, Raymond A., III; Julien, Paul C.; Bolte, Steven B.; and Knapp, John P., 4,965,158, Cl. 430-106.600.
Jung, Il Nam; Hwang, Sang Yo; and Bae, Hae Kyung, to Korea Advanced Institute of Science and Technology. Organosilane stabilizers for inorganic silicates in antifreezer/coolant compositions. 4,965,385, Cl. 556-416.000.
Jung, Wayne: *See*—
Saki, Yosinori; Kotera, Hiroshi; Unemoto, Kazuo; Arikawa, Tomohiko; Jung, Wayne; Tutt, Timothy; and Dunk, Mike, 4,965,558, Cl. 340-712.000.
Junkosha Co., Ltd.: *See*—
Hoshiko, Takeshi, 4,965,290, Cl. 521-54.000.
Jurievich, Kiselev N.: *See*—
Tupitsyn, Konstantin K.; Tupitsyn, Sergei; Kamensky, Veniamin; and Jurievich, Kiselev N., 4,964,477, Cl. 175-296.000.
Jurissen, Gunter; and Eichler, Angelika, to INorddeutsche Industrie Christiansen & Co.(GmbH & Co.). Flexible grinding tool and process for producing it. 4,964,884, Cl. 51-295.000.
Jurkowski, Keith O.; and Wycoff, David C., to Harnischfeger Corporation; and Yaskawa Electric Mfg. Co. Ltd. Method and apparatus for detecting deviation of motor speed from frequency of power supply. 4,965,847, Cl. 388-814.000.
Juska, Donald D.: *See*—
Crutcher, John P.; Hueil, J. Charles; and Juska, Donald D., 4,964,558, Cl. 227-8.000.
K. J. Manufacturing: *See*—
Bedi, Ram, 4,964,373, Cl. 123-196.00R.
Kabacoff, Lawrence T.; and Ferrando, William, to United States of America, Navy. Corrosion resistant metallic glass coatings. 4,965,139, Cl. 428-682.000.
Kabashima, Kazuo: *See*—
Hiraishi, Shigetoshi; and Kabashima, Kazuo, 4,965,237, Cl. 503-209.000.
Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See*—
Misaki, Akira; Sone, Yoshiaki; Mitsuhashi, Masakazu; and Miyake, Toshio, 4,965,347, Cl. 536-1.100.
Kabushiki Kaisha Honda Lock: *See*—
Tanaka, Akira; Fukamachi, Masaaki; and Sakata, Kazuhiro, 4,965,460, Cl. 307-10.200.
Kabushiki Kaisha Iseki Kaihatsu Koki: *See*—
Akesaka, Toshio, 4,964,580, Cl. 241-252.000.
Kabushiki Kaisha Nippon Conlux: *See*—
Nishiumi, Kenji; Kasuya, Toru; Mori, Yoshikazu; and Itako, Eiji, 4,964,517, Cl. 209-534.000.
Kabushiki Kaisha Showa Seisakusho: *See*—
Kawamura, Sadao, 4,964,625, Cl. 267-221.000.
Kabushiki Kaisha Takara: *See*—
Tsuda, Masaaki, 4,964,942, Cl. 156-468.000.
Kabushiki Kaisha Toshiba: *See*—
Endoh, Kenjiro, 4,965,680, Cl. 360-60.000.
Ishizuka, Kiminori, 4,965,614, Cl. 346-34.000.
Iwasaki, Hiroshi, 4,965,220, Cl. 437-59.000.
Kasai, Toshihiro; and Kouyama, Mitsuaki, 4,965,598, Cl. 346-160.100.
Nishimura, Akira; and Nozuyama, Yasuyuki, 4,965,511, Cl. 324-73.100.
Okazaki, Yukio, 4,965,541, Cl. 333-252.000.
Tarumi, Kazuo; and Watanabe, Tsutomu, 4,965,485, Cl. 313-43.000.
Kabushiki-kaisha Toyo Seisakusho: *See*—
Matsushita, Kyozo, 4,964,298, Cl. 73-117.100.
Kabushiki Kaisha Universal: *See*—
Ishida, Naomi, 4,964,638, Cl. 273-138.00A.
Kabushiki Kaisha Yokota: *See*—
Yokota, Takashi, 4,965,498, Cl. 318-468.000.
Kaelin, John J.; and Port, Gary L., to Huck Manufacturing Company. Shock-absorbing fluid-actuated pressure system. 4,964,292, Cl. 72-453.170.
Kaemmer, Bruce G.: *See*—
Patel, Punam M.; and Kaemmer, Bruce G., 4,964,363, Cl. 118-405.000.
Kagawa, Akinobu; Inoue, Teruichi; Kametani, Masaru; and Nakamura, Koji, to Koyo Seiko Co., Ltd. Ball bearing. 4,964,742, Cl. 384-515.000.
Kagaya, Isao: *See*—
Ohnishi, Osamu; Takahashi, Sadayuki; Myohga, Osamu; Uchikawa, Tadao; Inoue, Takeshi; Kagaya, Isao; and Ueha, Sadayuki, 4,965,482, Cl. 310-323.000.
Kahrilas, Peter J.; Miller, Thomas W.; and Lazzara, Samuel P., to Hughes Aircraft Company. Digital beamforming for multiple independent transmit beams. 4,965,602, Cl. 342-372.000.
Kailath, Thomas: *See*—
Roy, Richard H., III; Paulraj, Arogyaswami J.; and Kailath, Thomas, 4,965,732, Cl. 364-460.000.
Kainuma, Osamu: *See*—
Yoshida, Hajime; Kamada, Tokuichi; and Kainuma, Osamu, 4,965,168, Cl. 430-204.000.
Kajima Corporation: *See*—
Kobori, Takuji; Kanayama, Hiroo; and Kamagata, Shuichi, 4,964,246, Cl. 52-1.000.

Kajitani, Hiroshi, to Funayama & Co., Ltd. Descaling abrading apparatus with abrading rolls. 4,964,201, Cl. 29-81.030.

Kalempa, Walenty: *See—*
Kleynjans, Joseph P. H.; and Kalempa, Walenty, 4,964,777, Cl. 414-401.000.

Kali-Chemie Pharma GmbH: *See—*
Maetzel, Uwe; and Heitmann, Walter, 4,965,369, Cl. 548-492.000.

Kalka, Josef: *See—*
Boeke, Burkhard; Kalka, Josef; and Winter, Hermann, 4,965,328, Cl. 526-212.000.

Kalugin, Jury V.: *See—*
Grischenko, Valentin I.; Kalugin, Jury V.; Luchko, Nina A.; and Chernysh, Elena N., 4,965,185, Cl. 435-1.000.
Grischenko, Valentin I.; Kalugin, Jury V.; Paraschuk, Jury S.; Luchko, Nina A.; Chernysh, Elena N.; Tarasov, Valery F.; and Galchenko, Sergei E., 4,965,186, Cl. 435-2.000.

Kamada, Tokuichi: *See—*
Yoshida, Hajime; Kamada, Tokuichi; and Kainuma, Osamu, 4,965,168, Cl. 430-204.000.

Kamagata, Shuichi: *See—*
Kobori, Takuji; Kanayama, Hiroo; and Kamagata, Shuichi, 4,964,246, Cl. 52-1.000.

Kaman Aerospace Corporation: *See—*
Ulich, Bobby L.; Calmes, Lonnie K.; and Elkins, William P., 4,964,721, Cl. 356-5.000.

Kameda, Kinya: *See—*
Kametaka, Shigeru; Miyazaki, Tadaaki; Hayashi, Shinichi; Handa, Akira; and Kameda, Kinya, 4,965,262, Cl. 514-230.200.

Kamei, Masato, to Bandai America Incorporated. Poseable toy animal. 4,964,836, Cl. 446-374.000.

Kamensky, Veniamin: *See—*
Tupitsyn, Konstantin K.; Tupitsyn, Sergei; Kamensky, Veniamin; and Jurievich, Kiselev N., 4,964,477, Cl. 175-296.000.

Kameta, Katsunobu; Morita, Kiyomi; Kikuchi, Takeshi; and Tanabe, Yoshiyuki, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Fuel supply control apparatus for an internal combustion engine. 4,964,390, Cl. 123-489.000.

Kametaka, Shigeru; Miyazaki, Tadaaki; Hayashi, Shinichi; Handa, Akira; and Kameda, Kinya, to Rohto Pharmaceutical Co., Ltd.; and Daiichi Pharmaceutical Co., Ltd. Method for treating of preventing locally periodontal disease. 4,965,262, Cl. 514-230.200.

Kametani, Masaru: *See—*
Kagawa, Akinobu; Inoue, Teruichi; Kametani, Masaru; and Nakamura, Koji, 4,964,742, Cl. 384-515.000.

Kamide, Akira: *See—*
Miyazaki, Yasuo; and Kamide, Akira, 4,965,036, Cl. 264-269.000.

Kamihara, Masaharu: *See—*
Abe, Toshio; Takahashi, Seiichi; Kamihara, Masaharu; Saito, Hitoshi; Tanaka, Seizo; and Suzuki, Yasuyuki, 4,965,483, Cl. 310-324.000.

Kamijo, Eiji: *See—*
Miyamoto, Yoshinari; Yamada, Osamu; Koizumi, Mitsue; Komura, Osamu; Kamijo, Eiji; Honda, Masaaki; and Yamakawa, Akira, 4,965,044, Cl. 419-12.000.

Kamille, Stuart J., to Longview Corporation. Variably scored skill game. 4,964,642, Cl. 273-240.000.

Kamimura, Takashi: *See—*
Inoue, Hideo; Ohtsuka, Eiko; Imura, Akihiro; Masuda, Kenichi; and Kamimura, Takashi, 4,965,350, Cl. 536-28.000.

Kamiya, Joji: *See—*
Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; and Nakano, Takuo, 4,965,263, Cl. 514-247.000.

Kammerer, Friedrich-Johannes: *See—*
Bartlett, Robert R.; Schleyerbach, Rudolf; and Kammerer, Friedrich-Johannes, 4,965,276, Cl. 514-378.000.

Kamon, Yoshiyuki; and Yamagishi, Makoto, to Sony Corporation. Ear piece transducer. 4,965,838, Cl. 381-187.000.

Kamp, Petrus J. M.; and Van Roermund, Arthur H. M., to U.S. Philips Corp. Switched capacitor network. 4,965,711, Cl. 363-60.000.

Kamyr AB: *See—*
Lysen, Claes G., 4,964,301, Cl. 73-290.00R.

Kamyr, Inc.: *See—*
Sherman, Michael I., 4,964,622, Cl. 266-168.000.

Kanai, Hirosumi, to AMP Incorporated. Connector holder. 4,964,817, Cl. 439-701.000.

Kanayama, Hiroo: *See—*
Kobori, Takuji; Kanayama, Hiroo; and Kamagata, Shuichi, 4,964,246, Cl. 52-1.000.

Kanegafuchi Chemical Industry Co., Ltd.: *See—*
Yamagishi, Hideo; Nevin, William A.; Nishio, Hitoshi; Miki, Keiko; Tsuge, Kazunori; and Tawada, Yoshihisa, 4,965,225, Cl. 437-173.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Hirose, Toshifumi; Yukimoto, Sadao; and Isayama, Katsuhiko, 4,965,311, Cl. 524-483.000.
Kanoo, Fumihiko; Yamane, Takehiko; Kondo, Hideo; Hashizume, Takuji; Yamashita, Katsuji; Hosoe, Kazunori; Kuze, Fumiyuki; and Watanabe, Kiyoshi, 4,965,261, Cl. 514-229.500.

Kaneko, Shuzo: *See—*
Kurabayashi, Yutaka; Ohnishi, Toshikazu; Yoshinaga, Kazuo; Mouri, Akihiro; Isaka, Kazuo; Kaneko, Shuzo; Eguchi, Takeo; and Toshida, Yomishi, 4,965,591, Cl. 346-108.000.

Kaneko, Yasuhiro; and Ito, Shinzo, to Nippondenso Co., Ltd. Luminance cumulative integrating method and apparatus in image processes. 4,965,841, Cl. 382-1.000.

Kanemasa, Akira: *See—*
Nakagawa, Fujio; and Kanemasa, Akira, 4,965,823, Cl. 379-411.000.

Kaneoya, Masakazu: *See—*
Uchida, Manabu; Yoshida, Naoyuki; and Kaneoya, Masakazu, 4,965,018, Cl. 252-299.610.

Kania, Charles M.; Anderson, Carl C.; and Sharma, Brij N., to PPG Industries, Inc. Coating composition with sag control agent. 4,965,317, Cl. 525-155.000.

Kannes, Deno, to Docu-Vision, Inc. Video conferencing system for courtroom and other applications. 4,965,819, Cl. 379-53.000.

Kanno, Hiroshi: *See—*
Wagatsuma, Yuki; and Kanno, Hiroshi, 4,965,744, Cl. 364-518.000.

Kanoo, Fumihiko; Yamane, Takehiko; Kondo, Hideo; Hashizume, Takuji; Yamashita, Katsuji; Hosoe, Kazunori; Kuze, Fumiyuki; and Watanabe, Kiyoshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Substituted benzoxazinorifamycin derivative and antibacterial agent containing the same. 4,965,261, Cl. 514-229.500.

Kansai Paint Co., Ltd.: *See—*
Maruyama, Tsutomu; Fukawa, Kiyotake; Akiyama, Atsushi; and Kiyomura, Yoshihiro, 4,965,073, Cl. 430-292.000.
Nakai, Noboru; Isozaki, Osamu; and Midogohchi, Susumu, 4,965,312, Cl. 524-506.000.

Kanshin, Nikolai N.; Lipatov, Viktor A.; and Guskov, Igor A., to Moskovsky Gorodskoi Nauchno-Issledovatelsky Institut Skoroi Pomoschi Imeni N.V. Sklifosovskogo. Device for establishing esophagoenterostomies. 4,964,863, Cl. 606-153.000.

Kao Corporation: *See—*
Hamaguchi, Koji; Togashi, Fumihiko; and Miyauchi, Yoshitaka, 4,964,949, Cl. 162-5.000.

Kapaan, Hendrikus J., to SKF Industrial Trading and Development Co. B.V. Universal coupling having a ring intermediate element. 4,964,840, Cl. 464-125.000.

Kappel, Glendon D.: *See—*
Malotke, Timothy P.; Kappel, Glendon D.; and Marohl, Charles H., 4,964,810, Cl. 439-368.000.

Kapps, Manfred: *See—*
Muller, Hanns P.; Kapps, Manfred; Vehlewald, Peter; Meyer, Frank; Cornely, Wolfgang; and Mehesch, Hans E., 4,965,292, Cl. 521-110.000.

Karakida, Kenichi; Yagi, Shigeru; Fukuda, Yuzuru; Nishikawa, Masayuki; Roh, Te Nam; Takahashi, Noriyoshi; and Ono, Masato, to Fuji Xerox Co., Ltd. Electrophotographic photoreceptor having surface layers. 4,965,154, Cl. 430-58.000.

Karas, Wlodzimierz; Granowski, Robert; Ramotowski, Witold; Tuziemski, Aleksander; Cieplak, Jerzy; and Pilawski, Kazimierz, to Huta Baildon Przedsiebiorstwo Panstwowe Katowice. Stabilizer for the treatment of the fracture of the neck and upper metaphysis of the femur. 4,964,403, Cl. 606-60.000.

Karasawa, Michito; Uchimoto, Mari; Kawabe, Hirofumi; Otani, Takuzo; and Aizawa, Katsuo, to Hamari Chemicals, Ltd. Pheophorbide derivatives. 4,965,064, Cl. 424-9.000.

Karasawa, Wataru, to Tokyo Electron Limited. Apparatus and method of testing a semiconductor wafer. 4,965,515, Cl. 324-158.00R.

Karlow, James P., to Automotive Systems Laboratory, Inc. Inflatable restraint. 4,964,652, Cl. 280-731.000.

Karna, Anssi; Heikkinen, Jukka; and Eskelinen, Juhani, to Valmet Paper Machinery Inc. Apparatus for coating a web with coating mix. 4,964,364, Cl. 118-410.000.

Karner, Friedrich A.; Phelps, Douglas W., Jr.; Starr, Stephen G.; and Ward, William C., to International Business Machines Corporation. Semiconductor package with ground plane. 4,965,654, Cl. 357-70.000.

Karriker, Roy L. Keyless handcuffs. 4,964,419, Cl. 128-879.000.

Karvonen, Robert. Extendible boom forklift with level reach control. 4,964,780, Cl. 414-728.000.

Kasai, Tetsuo: *See—*
Hirahara, Takuji; Nakamura, Takashi; Kumeno, Yoshiko; Ohta, Takayuki; and Kasai, Tetsuo, 4,965,302, Cl. 524-83.000.

Kasai, Toshihiro; and Kouyama, Mitsuaki, to Kabushiki Kaisha Toshiba. Printing apparatus. 4,965,598, Cl. 346-160.100.

Kashiwazaki, Takashi: *See—*
Fukushima, Atsuhiko; Kashiwazaki, Takashi; Hosoi, Masayuki; and Ando, Hitoshi, 4,965,574, Cl. 340-995.000.

Kashiyama, Kotaro: *See—*
Ichikawa, Minoru; Kashiyama, Kotaro; and Furukawa, Tomomitsu, 4,964,420, Cl. 137-171.000.

Kashiyama, Ritsuo, to Canon Kabushiki Kaisha. Drive circuit for vibratory-wave motor. 4,965,481, Cl. 310-316.000.

Kasina, Sudhakar: *See—*
Fritzberg, Alan R.; Kasina, Sudhakar; Rao, Tripuraneni N.; VanderHeyden, Jean-Luc; and Srinivasan, Ananthachari, 4,965,392, Cl. 558-254.000.

Kassara, Toru: *See—*
Nishiumi, Kenji; Kassara, Toru; Mori, Yoshikazu; and Itako, Eiji, 4,964,517, Cl. 209-534.000.

Kassel, Philip C., Jr.: *See—*
Kinard, William H.; Singer, S. Fred; Wortman, Jim J.; Humes, Donald H.; Kassel, Philip C., Jr.; and Stanley, John E., deceased, 4,964,300, Cl. 73-170.00R.

Katakami, Tsutomu: *See—*
Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; and Nakano, Takuo, 4,965,263, Cl. 514-247.000.

Katayama, Hideaki; Murakami, Toshifumi; Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; and Ijiri, Masaaki, to Mitsubishi Jukogyo Kabushiki Kaisha; and

Sumitomo Rubber Industries Ltd. Upper metal mold clamp device in a tire vulcanizing machine. 4,964,792, Cl. 425-32.000.

Katayama, Tsutomu: *See*—
Akasaka, Takeshi; Ochi, Kumie; Onari, Kazuhiro; Katayama, Tsutomu; Furuta, Hitoshi; Nakae, Kazumi; and Fukuda, Satomi, 4,965,080, Cl. 426-104.000.

Kato, Kinya; Ushida, Kazuo; Namikawa, Toshiyuki; Matsumoto, Koichi; Suwa, Kyoichi; and Ohno, Koichi, to Nikon Corporation. Projection exposure apparatus. 4,965,630, Cl. 355-52.000.

Kato, Masatake, to Canon Kabushiki Kaishi. Finder optical device. 4,964,686, Cl. 350-561.000.

Katoh, Eiichi; Asakura, Koichi; Hasegawa, Yutaka; and Bando, Toshiro, to Ricoh Company, Ltd. Control device for an image forming apparatus. 4,965,637, Cl. 355-246.000.

Katoh, Kazunobu: *See*—
Ukai, Toshinao; Shirasu, Kazuhiro; Nakamura, Koki; Koya, Keizo; Okada, Masahiro; and Katoh, Kazunobu, 4,965,170, Cl. 430-264.000.

Katsnelson, Inessa: *See*—
Kraus, Menaham; Heisler, Mark; Katsnelson, Inessa; and Velazques, Diosie, 4,964,990, Cl. 210-490.000.

Katsura, Koyo: *See*—
Matsuo, Shigeru; Katsura, Koyo; Sato, Jun; Sone, Takashi; and Yokoyama, Masakatu, 4,965,750, Cl. 364-521.000.

Katsuyama, Ichirou: *See*—
Tachikawa, Makoto; Suzuki, Osamu; Hashimoto, Tadahiko; Igari, Kuniyuki; and Katsuyama, Ichirou, 4,964,719, Cl. 353-85.000.

Katz, Allen, to General Electric Company. Parallelled amplifier with switched isolation resistors. 4,965,530, Cl. 330-295.000.

Katz, Hyman, to Exxel Container, Inc. Pressurized fluid dispenser and method of making the same. 4,964,540, Cl. 222-95.000.

Kaufman, Robert J.: *See*—
Brannigan, Lawrence H.; Brinker, Ronald J.; Kaufman, Robert J.; and Metz, Suzanne, 4,964,893, Cl. 71-88.000.

Kautz, Kenrick W.: *See*—
Chan, Luen C.; and Kautz, Kenrick W., 4,965,845, Cl. 382-56.000.

Kautz, Thomas O., to Johnson Service Company. Offset adjust for moving coil transducer. 4,965,475, Cl. 310-13.000.

Kawabata, Masami; Harada, Masahiko; and Takimoto, Yasuyuki, to Nippon Paint Co., Ltd. Photopolymerizable composition. 4,965,171, Cl. 430-288.000.

Kawabata, Toshiharu; Koike, Susumu; Matsuda, Toshio; and Iwasa, Hitoo, to Matsushita Electric Industrial Co., Ltd. Pure green light emitting diodes and method of manufacturing the same. 4,965,644, Cl. 357-17.000.

Kawabe, Hirofumi: *See*—
Karasawa, Michito; Uchimoto, Mari; Kawabe, Hirofumi; Otani, Takuzo; and Aizawa, Katsuo, 4,965,064, Cl. 424-9.000.

Kawaguchi, Shigeru: *See*—
Inoue, Kunitoshi; Kawaguchi, Shigeru; and Nomoto, Kazuhiro, 4,964,293, Cl. 72-379.200.

Kawaguchi, Yoshiyuki: *See*—
Shizaki, Tomoo; Kawaguchi, Yoshiyuki; Nakano, Yasuhiko; Gotoda, Yusuke; and Takemura, Hiroo, 4,964,381, Cl. 123-73.00A.

Kawahara, Haruyuki; Tanaka, Katsumi; Ashiura, Yasuyuki; and Yoshimura, Motonobu, to Haruyuki Kawahara; and Toho Titanium Co., Ltd. Endosseous implant having polycapillary structure. 4,964,801, Cl. 433-173.000.

Kawai, Mitsuru; Yoshida, Masaru; and Sasaki, Yoshihiro, to Hirose Electric Co., Ltd. Electrical connector. 4,964,815, Cl. 439-610.000.

Kawai, Yoshio: *See*—
Oku, Teruo; Kawai, Yoshio; Kayakiri, Hiroshi; Kuratani, Kazuyoshi; and Hashimoto, Masashi, 4,965,274, Cl. 514-311.000.

Kawaike, Kazuhiko: *See*—
Nakano, Masaaki; Inoue, Tomoaki; Kawaike, Kazuhiko; Yamamoto, Yuji; and Ishikawa, Motoyuki, 4,964,740, Cl. 384-313.000.

Kawajiri, Shogo; Ito, Akio; and Yamamoto, Katsumi, to NGK Spark Plug Co., Ltd. Non-resonating type knock sensor. 4,964,294, Cl. 73-35.000.

Kawakami, Hiroshi: *See*—
Murata, Yoshitaka; and Kawakami, Hiroshi, 4,964,190, Cl. 15-369.000.

Kawakita, Takao: *See*—
Murai, Teruyuki; Hashimoto, Yoshihiro; and Kawakita, Takao, 4,964,209, Cl. 29-527.600.

Kawamoto, Manabu, to Du Pont-Mitsui Polychemicals Co., Ltd. Polymer composition. 4,965,319, Cl. 525-194.000.

Kawamura, Masao; and Usui, Minoru, to Casio Computer Co., Ltd. Signal electrode drive circuit for image display apparatus operable under low frequency. 4,965,566, Cl. 340-793.000.

Kawamura, Sadao, to Kabushiki Kaisha Showa Seisakusho. Hydraulic damper with oil lock mechanism. 4,964,625, Cl. 267-221.000.

Kawamura, Yoshihiro: *See*—
Yarita, Yoshio; and Kawamura, Yoshihiro, 4,964,947, Cl. 156-645.000.

Kawan, Antoine, to Gillette Company, The. Wrinkle masking composition of sodium polystyrene sulfonate and process for use. 4,965,071, Cl. 424-401.000.

Kawanami, Katsusuke: *See*—
Oki, Takehiko; Fukushima, Fumio; and Kawanami, Katsusuke, 4,964,587, Cl. 242-78.100.

Kawanishi, Hidekata: *See*—
Nomura, Shoichi; Kitagawa, Akira; Kawanishi, Hidekata; and Shibata, Tsuneo, 4,965,434, Cl. 392-407.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Tamba, Shinichi; and Miguchi, Akio, 4,964,378, Cl. 123-41.570.

Kawasaki Steel Corp.: *See*—
Kiyota, Yoshisato; Ohta, Jusichi; Ohtsubo, Hiroshi; and Takajo, Shigeaki, 4,964,907, Cl. 75-235.000.
Yukumoto, Masao; Shibuya, Kiyoshi; Morito, Nobuyuki; and Hiramatsu, Teruo, 4,964,583, Cl. 242-56.00R.

Kawashima, Asahi: *See*—
Hashimoto, Koji; Kumagai, Naokazu; Asami, Katsuhiko; and Kawashima, Asahi, 4,964,967, Cl. 204-292.000.

Kawata, Tatsuo: *See*—
Ogata, Masatsugu; Segawa, Tadanori; Abe, Hidetoshi; Suzuki, Shigeo; and Kawata, Tatsuo, 4,965,657, Cl. 357-72.000.

Kayakiri, Hiroshi: *See*—
Oku, Teruo; Kawai, Yoshio; Kayakiri, Hiroshi; Kuratani, Kazuyoshi; and Hashimoto, Masashi, 4,965,274, Cl. 514-311.000.

Kayanuma, Nobuaki, to Toyota Jidosha Kabushiki Kaisha. Air-fuel ratio feedback control system including at least downstreamside air-fuel ratio sensor. 4,964,272, Cl. 60-274.000.

Kazahaya, Nobuaki: *See*—
Kodera, Tokio; and Kazahaya, Nobuaki, 4,965,118, Cl. 428-137.000.

KCL Corp.: *See*—
Branson, Mark E.; and Edelman, Paul F., 4,964,739, Cl. 383-5.000.

Kearns, Michael W.: *See*—
Neal, Donald F.; Kearns, Michael W.; Fox, Stephen P.; Melville, James E.; Wright, Kenneth W.; Wood, Philip S.; Pinder, John T.; and Clark, Stephen C., 4,964,564, Cl. 228-107.000.

Keating, James T.; and Perusich, Stephen A., to Du Pont de Nemours, E. I., and Company. Cation exchange reinforced membrane and process for using. 4,964,9C0, Cl. 204-98.000.

Keebler Company: *See*—
Martin, August J.; and Mooi, Raymond, 4,965,076, Cl. 426-18.000.
Martin, August J.; and Furia, Thomas E., 4,965,077, Cl. 426-18.000.

Keener, Robert L. Ring sizer. 4,964,222, Cl. 33-544.400.

Keil, John, Jr.: *See*—
Von Brandt, Kim; Blakeslee, Bruce L.; Keil, John, Jr.; and Stroud, Robert D., 4,964,941, Cl. 156-360.000.

Keister, Pamela P.; Mead, Ralph T.; Muffoletto, Barry C.; Takeuchi, Esther S.; Ebel, Steven J.; Zelinsky, Michael A.; and Greenwood, John M., to Wilson Greatbatch Ltd. Non-aqueous lithium battery. 4,964,877, Cl. 29-623.100.

Keith, Michael, to Intel Corporation. Spatial transformation of node points in computer graphics using vector differences between their spatial coordinates. 4,965,752, Cl. 364-522.000.

Kelaita, Joseph B., Jr.; Arnold, David; and Smith, James I., to General Electric Company. Molded case circuit breaker exhaust barrier. 4,965,544, Cl. 335-202.000.

Kell, Douglas B. Determination of biomass. 4,965,206, Cl. 435-291.000.

Kelly, Kevin G. Diagnostic method for dermature testing. 4,964,412, Cl. 128-740.000.

Kendall Company, The: *See*—
Sancaktar, Erol, 4,965,119, Cl. 428-192.000.

Kennametal Inc.: *See*—
Mehrotra, Pankaj K.; and Billman, Elizabeth R., 4,965,231, Cl. 501-89.000.

Kennedy, Charles G.; McKeown, Patrick D.; and Neiger, Jack W., to Cyclops Corporation. Fence system and components. 4,964,618, Cl. 256-24.000.

Kenyon, William B., Jr., to McCormick & Company, Inc. Dispensing closure having an interior sealing sleeve, a threaded sleeve engaging a threaded tube, and stop blocks limiting twisting of the closure cap. 4,964,548, Cl. 222-521.000.

Kerby, Michael C.; and Eichhorn, Bryan W., to Exxon Research and Engineering Company. Organo-metallic crystalline polymer of molybdenum carboxylate and bidentate ligand. 4,965,381, Cl. 556-18.000.

Kerherve, Jean-Pierre; and Querornes, Armel, to Saint-Gobain Vitrage. Alkali free and alkaline earth free dibutyl tin difluoride powder. 4,965,383, Cl. 556-104.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Poppe, Ulrich; Schubert, Jurgen; and Evers, Wilhelm, 4,965,248, Cl. 505-1.000.

Kessel, Rudolf: *See*—
Sorg, Helmut; Pieper, Helmut; and Kessel, Rudolf, 4,965,812, Cl. 373-36.000.

Kessler, L. J.: *See*—
Kessler, Lawrence J.; and Bolitho, Larry I., 4,964,194, Cl. 17-11.000.

Kessler, Lawrence J.; and Bolitho, Larry I., to Kessler, L. J.; Bolitho, L. I.; and Park Poultry, Inc., part interest to each. Apparatus and method for diajointing the thighbones of poultry carcasses. 4,964,194, Cl. 17-11.000.

Keys, Dalen E.; Smothers, William K.; and Trout, Torence J., to Du Pont de Nemours, E. I., and Company. Holographic notch filters. 4,965,152, Cl. 430-1.000.

Keystone International, Inc.: *See*—
Chou, Alan F., 4,964,432, Cl. 137-15.000.

Kidd, R. Christopher: *See*—
Morrow, Lester; and Kidd, R. Christopher, 4,964,546, Cl. 222-352.000.

Kidde Industries, Inc.: *See*—
Muto, James A.; and Patel, Ramesh P., 4,964,778, Cl. 414-700.000.

Kidder, Kenneth B.: *See*—
Patton, Paul B.; and Kidder, Kenneth B., 4,965,755, Cl. 364-550.000.

Kieninger, Walter, to Entwicklungszentrum fur Zerspanungstechnik GmbH & Co. KG. Cutter head. 4,964,763, Cl. 407-40.000.

Kiesel, David R.: *See*—
Im, Jang-hi; Maugans, Rexford A.; and Kiesel, David R., 4,965,135, Cl. 428-412.000.

Kiewert, Eva: *See*—
Jeschke, Peter; Kiewert, Eva; Niceendick, Claus; Nuesslein, Hans; and Sandkuehler, Peter, 4,965,014, Cl. 252-174.220.

Kikkoman Corporation: *See*—
Umetsu, Yukihide; Hasegawa, Hideo; Takahashi, Toshio; and Miyagawa, Masayuki, 4,964,522, Cl. 215-100.00A.

Kikuchi, Satoru, to Kioritz Corporation. Piston for two-cycle internal combustion engine. 4,964,382, Cl. 123-73.0AA.

Kikuchi, Takeshi: *See*—
Kameta, Katsunobu; Morita, Kiyomi; Kikuchi, Takeshi; and Tanabe, Yoshiyuki, 4,964,390, Cl. 123-489.000.

Kikuchi, Toshiro: *See*—
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Kilmartin, John D., III, to International Packaging Corporation. Display assembly. 4,964,520, Cl. 211-131.000.

Kim, Jea Cheol: *See*—
Kim, You Seung; Park, Sang Woo; and Kim, Jea Cheol, 4,965,396, Cl. 560-21.000.

Kim, Seong: *See*—
Chang, Hershow; Kim, Seong; and Motoyama, Tetsuro, 4,965,748, Cl. 364-519.000.

Kim, You Seung; Park, Sang Woo; and Kim, Jea Cheol, to Korea Advanced Institute of Science and Technology. Nitrobenzoyl-3-cyclopropylaminoacrylates and a process for the preparation thereof. 4,965,396, Cl. 560-21.000.

Kimberly-Clark Corporation: *See*—
Morman, Michael T., 4,965,122, Cl. 428-225.000.
Potts, David C.; Win, Maug H.; and Garvey, Lee P., 4,965,000, Cl. 252-8.750.

Kimes, Robert H. Toilet seat for disabled persons. 4,964,179, Cl. 4-239.000.

Kimura, Hidetoshi; and Toya, Hiroki, to Bridgestone Corporation. Cutting apparatus for sheet-like materials. 4,965,733, Cl. 364-474.090.

Kimura, Sadao, to Usui Kokusai Sangyo Kaisha Ltd. Small-diameter metallic conduit bending machine. 4,964,290, Cl. 72-217.000.

Kinard, William H.; Singer, S. Fred; Wortman, Jim J.; Humes, Donald H.; Kassel, Philip C., Jr.; and Stanley, John E., deceased (by Stanley, Marguerite, executrix), to United States of America, National Aeronautics and Space Administration. Method and apparatus for determining time, direction and composition of impacting space particles. 4,964,300, Cl. 73-170.00R.

Kinetrol Limited of Trading Estate: *See*—
Nash, John V., 4,964,273, Cl. 60-325.000.

King, Francis C.: *See*—
Agee, John M.; and King, Francis C., 4,964,861, Cl. 606-87.000.

King, James P., to Atochem North America, Inc. Lubrication blends. 4,965,001, Cl. 252-30.000.

King, William P.: *See*—
Thompson, Ronald E.; and King, William P., 4,964,900, Cl. 55-387.000.

Kinney, Frederick D.: *See*—
Bobrowski, Gregory S.; Guecia, Gregory C. J.; Lupyan, David A.; and Kinney, Frederick D., 4,964,917, Cl. 106-804.000.

Kinoshita, Kenichiro: *See*—
Yoshida, Hiroshi; Noguchi, Takeki; Ichikawa, Masahiko; Nakane, Takemi; Kubo, Kyoji; and Kinoshita, Kenichiro, 4,964,734, Cl. 374-14.000.

Kinoshita, Mitsuya; Mihara, Masaaki; Kobayashi, Toshifumi; and Hamamoto, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Associative memory having simplified memory cell circuitry. 4,965,767, Cl. 365-49.000.

Kinsley, John P.: *See*—
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Kinugawa, Kiyoshige: *See*—
Mano, Hiroyuki; Kinugawa, Kiyoshige; and Tsunekawa, Satoru, 4,965,563, Cl. 340-784.000.

Kinzel, Richard: *See*—
Schueler, Hans; Lauterbach, Heinz; Tschoeke, Helmut; Kinzel, Richard; and Stipek, Theodor, 4,964,789, Cl. 417-494.000.

Kioritz Corporation: *See*—
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Kipnis, Alexander: *See*—
Johnson, Michael T.; and Kipnis, Alexander, 4,964,411, Cl. 128-733.000.

Kirby, Alan, to Digital Equipment Corporation. Method and apparatus for transmitting and receiving characters using a balanced weight error correcting code. 4,965,883, Cl. 371-52.000.

Kirby, Ralph: *See*—
Braine, Mark D.; Kirby, Ralph; Schultz, Donald W.; Tuttle, Richard G.; Ferg, Nelson M.; Hickman, John B.; and Webb, William C., 4,964,248, Cl. 52-60.000.

Kirchhoff, Robert A., to Dow Chemical Company, The. N-substituted arylcyclo butenyl-unsaturated cyclic imides. 4,965,329, Cl. 526-259.000.

Kirilloff, Victor V.; Cummins, Robert; and Benson, William A., to Mosebach Manufacturing Company. Composite pedestal liner. 4,964,346, Cl. 105-225.000.

Kirk, John; and Narhi, Larry, to Digital Equipment Corporation. Bus data path control scheme. 4,965,723, Cl. 364-200.000.

Kirschner, Jonathan; and Saunders, William J., to Coca-Cola Company, The. Open top tank having a removable and sealable lid with a flow rate control device supported therein. 4,964,532, Cl. 222-1.000.

Kishi, Hiroyoshi: *See*—
Arai, Ryuichi; Haruta, Masahiro; Yamamoto, Nobuko; Yano, Tetsuya; Kishi, Hiroyoshi; and Sakuranaga, Masanori, 4,965,174, Cl. 430-340.000.

Kishi, Katsunobu, to Nitto Kohki Co., Ltd. Chamfering machine. 4,964,765, Cl. 409-181.000.

Kishimoto, Kazuo, to Teijin Chemicals, Ltd. Polycarbonate composition. 4,965,303, Cl. 524-107.000.

Kisiel, Stanley T.: *See*—
Roberts, Edward A.; Spittal, Douglas W.; and Kisiel, Stanley T., 4,965,103, Cl. 428-31.000.

Kitagawa, Akira: *See*—
Nomura, Shoichi; Kitagawa, Akira; Kawanishi, Hideksta; and Shibata, Tsuneo, 4,965,434, Cl. 392-407.000.

Kitoh, Hideaki; Seita, Yukio; Koyama, Noriyuki; and Yokomachi, Shinsuke, to Terumo Kabushiki Kaisha. Method of manufacturing porous membrane and porous membrane manufactured by the same method. 4,965,291, Cl. 521-64.000.

Kitsunezuka, Akira: *See*—
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Kiyomura, Yoshihiro: *See*—
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Kiyonaga, Tetsuya: *See*—
Naito, Takao; Chiksma, Terumi; Watanabe, Shigeki; Kiyonaga, Tetsuya; Onoda, Yoshihito; Kuwahara, Hideo; Onaka, Hiroshi; and Miyata, Hideyuki, 4,965,858, Cl. 455-619.000.

Kiyota, Yoshisato; Ohta, Junichi; Ohtsubo, Hiroshi; and Takajo, Shigeaki, to Kawasaki Steel Corp. Sintered bodies and production process thereof. 4,964,907, Cl. 75-235.000.

Klaus, Joseph C. Water saver valve. 4,964,421, Cl. 137-460.000.

Klei, Ebel: *See*—
Barton, Roger E. C.; Van Breen, Adriaan W.; and Klei, Ebel, 4,965,104, Cl. 428-34.100.

Klein, Peter P.: *See*—
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Kleineberg, Wolfgang: *See*—
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Kleinewefers GmbH: *See*—
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Kleinknecht, Hans P.; and Knop, Karl H., to General Electric Company. Apparatus and method for optical dimension measurement using interference of scattered electromagnetic energy. 4,964,726, Cl. 356-357.000.

Klemm, Gerhard, to Gerhard Klemm Maschinenfabrik GmbH & Co. Screen printing method. 4,964,335, Cl. 101-129.000.

Klessing, Klaus; and Chatterjee, Shyam S., to Dr. Willmar Schwabe GmbH & Co. Amino acid esters, process for the preparation thereof and use thereof. 4,965,283, Cl. 514-422.000.

Kleynjans, Joseph P. H.; and Kalempa, Walenty, to Eriks Holding N.V. Truck restraining device. 4,964,777, Cl. 414-401.000.

Klinefelter, Gary M., to Research, Incorporated. Adjustable overlay display controller. 4,965,670, Cl. 358-183.000.

Klingbiel, Richard T.: *See*—
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Klingl, Karl-Heinz, to Georg Spiess GmbH. Device for conveying workpieces. 4,964,498, Cl. 198-347.100.

Kloft, Michael: *See*—
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Kloth, Bernd; and Behnk, Holger, to Labor Laborgerate'Analysensysteme Vertriebsgesellschaft mbH, Firma. Blood coagulation time measuring device. 4,964,728, Cl. 356-427.000.

Knapp, John F.: *See*—
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Knecht, Harry L., to Honeywell Inc. Apparatus for providing configurable safe-state outputs in a failure mode. 4,965,714, Cl. 364-187.000.

Knight, Peter C.: *See*—
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Knispel, Gottfried: *See*—
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Knitsch, Gerhard: *See*—
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Knoll, Randall L.; Aysta, James E.; and Lewon, Wilhelm, to Minnesota Mining and Manufacturing Company. Intraocular lens anchoring filament to lens element fixation method. 4,964,206, Cl. 29-424.000.

Knop, Karl H.: *See*—
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Knudsen, Michael J. Protective shield for stove. 4,964,393, Cl. 126-211.000.

Knuppel, Manfred: *See—*
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Kobayashi, Koichi: *See—*
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Kobayashi, Kouji; Minami, Hideyuki; and Nagashima, Shinichi, to Mitsuba Electric Mfg. Co., Ltd. DC motor with a durable pigtail arrangement. 4,965,478, Cl. 310-249.000.
Kobayashi, Michihito: *See—*
Katayama, Hideaki; Murakami, Toshifumi; Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; and Ijiri, Masaaki, 4,964,792, Cl. 425-32.000.
Kobayashi, Satoru: *See—*
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Kobayashi, Toshifumi: *See—*
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Kobori, Takuji; Kanayama, Hiroo; and Kamagata, Shuichi, to Kajima Corporation. Rigidity control system for variable rigidity structure. 4,964,246, Cl. 52-1.000.
Kodama, Hironori: *See—*
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Kodama, Shinichi: *See—*
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Kodera, Tokio; and Kazahaya, Nobuaki, to Dai Nippon Insatsu Kabushiki Kaisha. Flexible optical information recording medium and method of manufacturing the same. 4,965,118, Cl. 428-137.000.
Koeniger, Nikolaus: *See—*
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Koester, Charles J., to Columbia University in the City of New York, The Trustees of. Ophthalmic image stabilization system. 4,964,717, Cl. 351-219.000.
Kohlert, Dieter: *See—*
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Kohno, Osamu: *See—*
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Kohno, Shigenori; and Tsujita, Kenji, to Konica Corporation. Carrier for developing electrostatic image, and developer for developing electrostatic latent image containing same carrier. 4,965,159, Cl. 430-108.000.
Kohno, Teruhisa: *See—*
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Koike, Shoji: *See—*
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Koike, Susumu: *See—*
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Koike, Takashi. Warning device for internal combustion engine. 4,965,549, Cl. 340-516.000.
Koizumi, Masahiro: *See—*
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Koizumi, Mitsue: *See—*
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Kolar, Cenek; Paal, Michael; Hermentin, Peter; and Kraemer, Hans P., to Behringwerke Aktiengesellschaft. Anthracycline derivatives having cytostatic activity. 4,965,352, Cl. 536-6.400.
Kolb, Walter, to Wolf-Gerate GmbH. Lawnmower with grass collection container. 4,964,266, Cl. 56-202.000.
Koller, Jurg: *See—*
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Kolpin, Hans J., to Atomic Energy of Canada Limited. Electron gun design using a lanthanum hexaboride cathode. 4,965,486, Cl. 313-270.000.
Kolvites, Albert; Cohn, Robert J.; Welch, John H.; Sickles, Willard J.; and Balazek, David T., to InterMetro Industries Corporation. Plastic frame system having a triangular support post. 4,964,350, Cl. 108-110.000.
Komatsu, Toshiyuki: *See—*
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Komiya, Jujiro; and Muto, Tadanobu, to Shinwa Sangyo Company, Ltd. Cross-flow type cooling tower. 4,964,977, Cl. 261-130.000.
Kommrusch, Richard S., to Motorola Inc. Tuneless monolithic ceramic filter manufactured by using an art-work mask process. 4,965,537, Cl. 333-202.000.
Komoriya, Haruhiko: *See—*
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Komura, Osamu: *See—*
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Komuro, Hirokazu, to Canon Kabushiki Kaisha. Liquid jet recording head with laminated heat resistive layers on a support member. 4,965,594, Cl. 346-140.00R.
Kon, Tatsuya: *See—*
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Kondoh, Harufusa; and Nakabayashi, Takeo, to Mitsubishi Denki Kabushiki Kaisha. Input circuit operable under different source voltages in semiconductor integrated circuit. 4,965,469, Cl. 307-446.000.
Kong, Stephen B.: *See—*
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Konica Corporation: *See—*
Fujita, Masami; Nakanishi, Kazuhiro; and Sameshima, Yoshinobu, 4,965,615, Cl. 354-145.100.
Horiuchi, Tohru, 4,965,616, Cl. 354-212.000.
Ishikawa, Masao; and Kuse, Satoru, 4,965,176, Cl. 430-378.000.
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Kopczynski, John F. All-terrain vehicle. 4,964,480, Cl. 180-22.000.
Kopp, Wilhelm, to Maschinenfabrik Bezner GmbH & Co. KG. Process for dividing up and recovering the individual materials from old cables. 4,964,577, Cl. 241-24.000.
Korber AG: *See—*
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Korber, Marinus L., Jr., to Watkins-Johnson Company. Microwave notch filter using pin diode shunted YIG resonators. 4,965,539, Cl. 333-202.000.
Korea Advanced Institute of Science and Technology: *See—*
Jung, Il Nam; Hwang, Sang Yo; and Bae, Hae Kyung, 4,965,385, Cl. 556-416.000.
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Schermanz, Karl; Saischek, Gerald; Kores, Dietmar; Graf, Josef; Haas, Gerhard; and Martetschlager, Kurt, 4,965,277, Cl. 514-385.000.
Korte, Heinrich; and Spix, Theo, to Korte-Licht. Flourescent lamp. 4,965,875, Cl. 362-217.000.
Korte-Licht: *See—*
Korte, Heinrich; and Spix, Theo, 4,965,875, Cl. 362-217.000.
Koseki, Toshio: *See—*
Tsukahara, Kengo; Otake, Takeshi; Saito, Masao; and Koseki, Toshio, 4,965,060, Cl. 423-376.000.
Kosha, Hideaki: *See—*
Masaki, Kouichi; Kosha, Hideaki; Miura, Toshihiko; and Tamai, Yasuo, 4,965,125, Cl. 428-329.000.
Koslo, Randy J.: *See—*
Lukacsko, Alison B.; and Koslo, Randy J., 4,965,065, Cl. 424-10.000.
Koss Corporation: *See—*
Andre, Eugene M.; Modzikowski, Allan G.; and Banks, Seth R., 4,965,836, Cl. 381-183.000.
Kotera, Hiroshi: *See—*
Saki, Yosinori; Kotera, Hiroshi; Unemoto, Kazuo; Arikawa, Tomohiko; Jung, Wayne; Tutt, Timothy; and Dunk, Mike, 4,965,558, Cl. 340-712.000.
Koubuchi, Yasushi; Onuki, Jin; and Koizumi, Masahiro, to Hitachi, Ltd. Semiconductor device. 4,965,656, Cl. 357-71.000.
Kouji, Hiroyuki; and Misumi, Teruyuki, to Asahi Kasei Kogyo Kabushiki Kaisha. N-substituted-phenylteraconimide compound, herbicidal composition, and method for the destruction of undesirable weeds. 4,964,905, Cl. 71-95.000.
Kouyama, Mitsuaki: *See—*
Kasai, Toshihiro; and Kouyama, Mitsuaki, 4,965,598, Cl. 346-160.100.
Kowalczyk, Karen B.: *See—*
Arnold, David; and Kowalczyk, Karen B., 4,965,418, Cl. 200-144.00R.
Koya, Keizo: *See—*
Ukai, Toshinao; Shirasu, Kazuhiro; Nakamura, Koki; Koya, Keizo; Okada, Masahiro; and Katoh, Kazunobu, 4,965,170, Cl. 430-264.000.
Koyama, Noriyuki: *See—*
Kitoh, Hideaki; Seita, Yukio; Koyama, Noriyuki; and Yokomachi, Shinsuke, 4,965,291, Cl. 521-64.000.
Koyama, Teruhisa: *See—*
Yuyama, Masahiro; Koyama, Teruhisa; Matsurra, Hideaki; and Date, Shinji, 4,965,321, Cl. 525-329.700.

Koyo Seiko Co., Ltd.: *See*—
Kagawa, Akinobu; Inoue, Teruichi; Kametani, Masaru; and Nakamura, Koji, 4,964,742, Cl. 384-515.000.

Kozo Iizuka, Director General, Agency of Industrial Science and Technology: *See*—
Ueyama, Satoshi; and Isoda, Satoru, 4,965,133, Cl. 428-411.100.

Kraemer, Hans P.: *See*—
Kolar, Cenek; Paal, Michael; Hermentin, Peter; and Kraemer, Hans P., 4,965,352, Cl. 536-6.400.

Kraemer, Werner, to CAE-Link Corporation, Link Flight. System for constructing images in 3-dimension from digital data to display a changing scene in real time in computer image generators. 4,965,753, Cl. 364-522.000.

Kramer, Wolfgang: *See*—
Wollweber, Detlef; Kramer, Wolfgang; Dutzmann, Stefan; and Brandes, Wilhelm, 4,965,275, Cl. 514-354.000.

Kranz, Walter, to Messerschmitt-Bolkow-Blohm GmbH. Fluid distributor. 4,964,592, Cl. 244-322.000.

Kranz, Walter, to Messerschmitt-Bolkow-Blohm GmbH. Missile having rotor ring. 4,964,593, Cl. 244-3.240.

Kraus, Charles E., to Excelermatic Inc. Infinitely variable traction roller transmission. 4,964,312, Cl. 74-199.000.

Kraus, George A.; and Reynolds, Donald L., to Iowa State University Research Foundation, Inc. Pyranoquinones with anticoccidial activity. 4,965,267, Cl. 514-253.000.

Kraus, Menahem; Heisler, Mark; Katsnelson, Inessa; and Velazques, Diosie, to Gelman Sciences, Inc. Filtration membranes and method of making the same. 4,964,990, Cl. 210-490.000.

Kriedt, Hans; Dietze, Andreas; and Fenk, Josef, to Siemens Aktiengesellschaft. Integrated semiconductor circuit. 4,965,510, Cl. 323-315.000.

Krieger, Eberhard: *See*—
Moser, Theodor; and Krieger, Eberhard, 4,964,262, Cl. 53-506.000.

Krieger, Paul A.: *See*—
Jones, Wallace R.; Isaksen, Robert A.; and Krieger, Paul A., 4,965,113, Cl. 428-40.000.

Krishna, Ashok S.; and Periaswamy, Ramamoorthy. Method for suppressing the dehydrogenation activity of deposited metals on inert solids in heavy oil pretreatment. 4,964,979, Cl. 208-253.000.

Kroneis, Herbert: *See*—
Wolfbeis, Otto; Kroneis, Herbert; and Offenbacher, Helmut, 4,965,087, Cl. 427-2.000.

Kroupa, Gregory D.: *See*—
Wong, Mon N.; and Kroupa, Gregory D., 4,965,868, Cl. 343-756.000.

Kruger, Bernd W.; Sasse, Klaus; Lunkenheimer, Winfried; Hoever, Franz P.; Nentwig, Gunther; and Behrenz, Wolfgang, to Bayer Aktiengesellschaft. Agents for repelling insects and mites. 4,965,286, Cl. 514-514.000.

Kruger, Manfred; and Schulte Strathaus, Franz-Erich, to F. E. Schulte Strathaus KG. Device for thermally joining ends of conveyor belts. 4,964,943, Cl. 156-498.000.

Kruger, Michael: *See*—
Rodi, Anton; and Kruger, Michael, 4,965,497, Cl. 318-372.000.

Kubli, Robert A.: *See*—
Elko, Gary W.; Kubli, Robert A.; McAteer, Jeffrey P.; and West, James E., 4,965,775, Cl. 367-119.000.

Kubo, Kanji, to Honda Giken Kogyo Kabushiki Kaisha. Suspension for motor vehicles. 4,964,651, Cl. 280-690.000.

Kubo, Kyoji: *See*—
Yoshida, Hiroshi; Noguchi, Takeki; Ichikawa, Masahiko; Nakane, Takemi; Kubo, Kyoji; and Kinoshita, Kenichiro, 4,964,734, Cl. 374-14.000.

Kubo, Yoichiro: *See*—
Watanabe, Noboru; and Kubo, Yoichiro, 4,965,323, Cl. 525-349.000.

Kubodera, Seiiti; Ikegawa, Akihiko; and Okazaki, Masaki, to Fuji Photo Film Co., Ltd. Heat-developable light-sensitive material comprising a sensitizing dye. 4,965,181, Cl. 430-350.000.

Kubose, Don A.: *See*—
Austin, F. Jon; and Kubose, Don A., 4,965,084, Cl. 426-422.000.

Kubota, Akinori: *See*—
Katayama, Hideaki; Murakami, Toshifumi; Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; and Ijiri, Masaaki, 4,964,792, Cl. 425-32.000.

Kubota Corporation: *See*—
Yoshitake, Akira; and Sakashita, Motoki, 4,964,924, Cl. 148-325.000.

Kubota Ltd.: *See*—
Shinno, Yoshio; and Nakade, Yasuhiko, 4,964,383, Cl. 123-195.00C.

Kubota, Yoshiya: *See*—
Katayama, Hideaki; Murakami, Toshifumi; Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; and Ijiri, Masaaki, 4,964,792, Cl. 425-32.000.

Kuhle, Engelbert: *See*—
Anderson, John; Homeyer, Bernhard; Kuhle, Engelbert; Scheinpflug, Hans; Zeck, Walter M.; and Simonet, Donald E., 4,965,254, Cl. 514-89.000.

Kuhn, Karen A.: *See*—
Clausen, Glenn A.; Kuhn, Karen A.; and Weldon, Kathryn P., 4,964,974, Cl. 208-108.000.

Kuhrts, Eric H., to Hauser-Kuhrts, Inc. Cholesterol-lowering combination compositions of guar gum and niacin. 4,965,252, Cl. 514-54.000.

Kumagae, Ryouhei: *See*—
Sakuno, Fumihiko; Sonoda, Hirofumi; Honda, Satoshi; and Kumagae, Ryouhei, 4,964,791, Cl. 425-8.000.

Kumagai, Naokazu: *See*—
Hashimoto, Koji; Kumagai, Naokazu; Asami, Katsuhiko; and Kawashima, Atshi, 4,964,967, Cl. 204-292.000.

Kumeno, Yoshiko: *See*—
Hirahara, Takuji; Nakamura, Takashi; Kumeno, Yoshiko; Ohta, Takayuki; and Kasai, Tetsuo, 4,965,302, Cl. 524-83.000.

Kummer, Christian F.: *See*—
Leiber, Hans-Jurgen; Meyer, Jean-Philippe; and Kummer, Christian F., 4,964,321, Cl. 82-12.000.

Kummer Freres Sa Fabrique de Machines: *See*—
Leiber, Hans-Jurgen; Meyer, Jean-Philippe; and Kummer, Christian F., 4,964,321, Cl. 82-12.000.

Kumobayashi, Hidenori: *See*—
Mikami, Koichi; Terada, Masahiro; Nakai, Takeshi; Sayo, Noboru; and Kumobayashi, Hidenori, 4,965,398, Cl. 560-60.000.

Kumpfmueller, Hans-Georg; and Schaefer, Joachim, to Siemens Aktiengesellschaft. Voltage doubling driving circuit for controlling a field effect transistor having a source load. 4,965,696, Cl. 361-160.000.

Kunegel, Jacques: *See*—
Coulmier, Jean-Pol; Lepere, Guy; and Kunegel, Jacques, 4,965,584, Cl. 342-159.000.
Lepere, Guy; Kunegel, Jacques; and Coulmier, Jean-Pol, 4,965,585, Cl. 342-160.000.

Kunihiro, Takushi, to Sony Corporation. Cordless telephone. 4,965,849, Cl. 455-34.000.

Kurabayashi, Yutaka; Ohnishi, Toshikazu; Yoshinaga, Kazuo; Mouri, Akihiro; Isaka, Kazuo; Kaneko, Shuzo; Eguchi, Takeo; and Toshida, Yomishi, to Canon Kabushiki Kaisha. Recording with polymer liquid crystal recording medium. 4,965,591, Cl. 346-108.000.

Kuraray Company, Ltd.: *See*—
Ikeda, Minoru; Ishii, Masaki; Ono, Hiroshi; and Saito, Koichi, 4,965,114, Cl. 428-64.000.
Maeda, Toshihiko; and Yoshimura, Noriaki, 4,965,404, Cl. 562-35.000.

Kuratani, Kazuyoshi: *See*—
Oku, Teruo; Kawai, Yoshio; Kayakiri, Hiroshi; Kuratani, Kazuyoshi; and Hashimoto, Masashi, 4,965,274, Cl. 514-311.000.

Kurauchi, Yoshitaka: *See*—
Oka, Masaaki; and Kurauchi, Yoshitaka, 4,965,844, Cl. 382-44.000.

Kurihara, Kazumasa; and Arai, Kenji, to Diesel Kiki Co., Ltd. Vehicle-running control system. 4,965,730, Cl. 364-431.090.

Kuroda, Shigeo: *See*—
Otsuka, Kanji; Kuroda, Shigeo; Sato, Katsuyuki; Nakamura, Hisashi; and Shouji, Shinichi, 4,965,653, Cl. 357-55.000.

Kurokawa, Junji: *See*—
Ogura, Masaaki; Ohta, Kiyotaka; Kurokawa, Junji; Ito, Masaji; and Hayasaka, Toshiaki, 4,965,871, Cl. 355-55.000.

Kurokawa, Makoto; Shimoda, Yoshihide; and Tsuchimoto, Shuhei, to Sharp Kabushiki Kaisha. Apparatus for the production of photoconductive components for use in electrophotography. 4,964,366, Cl. 118-429.000.

Kurono, Yoshikazu: *See*—
Yokoe, Masaaki; Kurono, Yoshikazu; Hayashi, Koji; Takagi, Tomoe; Matsushita, Narihiro; and Takagi, Yuzo, 4,964,352, Cl. 112-103.000.

Kurose, Kazutoshi, to Gomeigaisha Kurose & Co. Method of assembling a panel assembly. 4,964,257, Cl. 52-741.000.

Kusakabe, Kenji; and Yamauchi, Keiji, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor production apparatus. 4,964,969, Cl. 204-298.120.

Kusche, David W., to Brunswick Corporation. Induction system for a two-cycle engine. 4,964,380, Cl. 123-52.0MF.

Kuse, Satoru: *See*—
Ishikawa, Masao; and Kuse, Satoru, 4,965,176, Cl. 430-378.000.

Kuwabara, Hidemitsu: *See*—
Hata, Ryosuke; Yamanouchi, Shosuke; Hirose, Masayuki; Kuwabara, Hidemitsu; Mizumoto, Yasuharu; and Hagiuda, Yasuhiro, 4,964,933, Cl. 156-209.000.

Kuwahara, Hideo: *See*—
Naito, Takao; Chikama, Terumi; Watanabe, Shigeki; Kiyonaga, Tetsuya; Onoda, Yoshihito; Kuwahara, Hideo; Onaka, Hiroshi; and Miyata, Hideyuki, 4,965,858, Cl. 455-619.000.

Kuwashima, Shigeru; and Mitsui, Akio, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 4,965,179, Cl. 430-504.000.

Kuwazuru, Mamoru: *See*—
Shukunobe, Yukitaka; Nakamura, Tetsuo; Yoshida, Tomoe; Doki, Ryoichi; Kuwazuru, Mamoru; and Shimoda, Kouzou, 4,965,051, Cl. 422-145.000.

Kuze, Fumiyuki: *See*—
Kanoo, Fumihiko; Yamane, Takehiko; Kondo, Hideo; Hashizume, Takuji; Yamashita, Katsuji; Hosoe, Kazunori; Kuze, Fumiyuki; and Watanabe, Kiyoshi, 4,965,261, Cl. 514-229.500.

Kylmakorpi, Ilpo: *See*—
Lamminen, Veikko; Hietikko, Erkki; and Kylmakorpi, Ilpo, 4,964,956, Cl. 162-203.000.

Laberge, Raymond, to Sport Maska, Inc. Method and apparatus for vacuum molding multi-layer footwear. 4,964,229, Cl. 36-93.000.

Labor Laborgerate'Analysensysteme Vertriebsgesellschaft mbH, Firma: *See*—
Kloth, Bernd; and Behnk, Holger, 4,964,728, Cl. 356-427.000.

Laboratorios Vinas, S.A.: *See*—
Sanfeliu, Amparo S.; Tuero, Lucia S.; Delgado de Molina Gonzalez, Maria J.; and Vinas, Antonio B., 4,965,365, Cl. 548-109.000.

Labrador, Grace D.: *See*—
Rau, Jerome E.; Palmer, Gary E.; and Labrador, Grace D., 4,964,189, Cl. 15-327.200.

LaForce, James W., Jr. Tanning tub. 4,964,183, Cl. 5-421.000.
Lagache, Remi: *See*—
Van Bogaert, Philippe; Moeneclaey, Denis; and Lagache, Remi, 4,964,443, Cl. 139-453.000.
Lai, Genhone, to Genhone Lai. Racket handle. 4,964,645, Cl. 273-73.00J.
Lai, Vu A.; and Menefee, Carol A., to W. L. Gore & Associates, Inc. Coaxial electrical cable construction. 4,965,412, Cl. 174-107.000.
Laico, Joseph P.; and Molino, Joseph L., to Lincoln Mills, Inc. Surgical limb supporting apparatus with tension measuring device. 4,964,400, Cl. 128-75.000.
L'Air Lquide, Societe Anonyme pour l'etude et l'Exploitation des Procedes Georges Claude: *See*—
Brugerolle, Jean-Renaud; and Ferenczi, Laurent, 4,964,886, Cl. 55-16.000.
Lakoski, Robert P.; and Numbers, Jody L., to Lama Systems Inc. Computer drive bezel attachment. 4,964,285, Cl. 70-14.000.
Lam, Lak M.: *See*—
Ejiri, Koichi; Jeng, Tina; Roth, Rithy; and Lam, Lak M., 4,965,676, Cl. 358-406.000.
Lama Systems Inc.: *See*—
Lakoski, Robert P.; and Numbers, Jody L., 4,964,285, Cl. 70-14.000.
Lamar, Richard S.; Pratt, William E.; Weber, Kenneth E.; and Roeder, Robert E., to Cyprus Mines Corporation. Method of reducing pitch in pulping and papermaking operations. 4,964,955, Cl. 162-164.600.
Lamatrice, Barbara A. Artificial eyebrow construction. 4,964,428, Cl. 132-216.000.
Lambrecht, Frank E.: *See*—
Bennett, Paul T.; Willard, David F.; Tahernia, Omid; Page, James C.; Spiro, Alan I.; and Lambrecht, Frank E., 4,965,569, Cl. 340-825.440.
Lamm, Gunther: *See*—
Dehnert, Johannes; Lamm, Gunther; and Loeffler, Hermann, 4,965,346, Cl. 534-766.000.
Lamminen, Veikko; Hietikko, Erkki; and Kylmakorpi, Ilpo, to Oy Tampella AB. Method of and a device for leading a web moving between two wires on to a desired wire. 4,964,956, Cl. 162-203.000.
Lamparter, Ronald C., to Transpec, Inc. Vehicle hatch mounting assembly. 4,964,673, Cl. 296-216.000.
Lancaster, Gerald M.; Pham, Tu-Anh; and Allen, James A., to Dow Chemical Company, The. Oxygen barrier resins. 4,965,314, Cl. 525-60.000.
Land, Cecil E.; and McKinney, Ira D., to Sandia Corporation. Method and apparatus for bistable optical information storage for erasable optical disks. 4,965,784, Cl. 369-100.000.
Landel, Eric: *See*—
Guevel, Pierre; Landel, Eric; Manzone, Jean-Michel; and Bouchet, Rene , 4,964,756, Cl. 405-26.000.
Landis, Timothy J. Protective shield and visor. 4,964,171, Cl. 2-9.000.
Landis, Wayne G.: *See*—
Haley, Mark V.; and Landis, Wayne G., 4,965,202, Cl. 435-170.000.
Landsbergen, Jeroen F. M.: *See*—
Legierse, Petrus E. J.; Beckers, Louis J. M.; and Landsbergen, Jeroen F. M., 4,964,958, Cl. 204-5.000.
Lang, Marc, to Ciba-Geigy Corporation. Bicyclic beta-lactam carboxylic acids. 4,965,260, Cl. 514-192.000.
Langley, David R.: *See*—
Saulnier, Mark G.; and Langley, David R., 4,965,348, Cl. 536-17.200.
Langlie, Ronald H.; and Berg, Jon A., to North Central Plastics, Incorporated. Electric fence insulator with latching capability. 4,965,413, Cl. 174-158.00F.
Lappohn, Jurgen; and Czeschka, Franz, to ERNI Elektroapparate GmbH. Pin-and-socket connector for light wave conductors. 4,964,690, Cl. 350-96.210.
Larex AG: *See*—
Lauener, Wilhelm F., 4,964,456, Cl. 164-481.000.
Larkin, John P.: *See*—
Casida, John E.; Palmer, Christopher J.; Larkin, John P.; and Smith, Ian H., 4,965,257, Cl. 514-149.000.
Larsen, Lawrence E. Apparatus for diathermy treatment and control. 4,964,415, Cl. 128-804.000.
Larsson, Karl O. A. H., to ISG/AG. Battery-powered breastpump. 4,964,851, Cl. 604-74.000.
Lat, Geronimo E.; and Gabriel, Willaim L., to Illinois Tool Works Inc. Costed metal fastener. 4,964,774, Cl. 411-446.000.
Latham, Robert P. Steering plate for outboard motor. 4,964,354, Cl. 114-144.00R.
Laubscher, Hans-Jorg: *See*—
Bognar, Daniel; and Laubscher, Hans-Jorg, 4,964,337, Cl. 101-350.000.
Lauener, Wilhelm F., to Larex AG. Continuous casting process and machine with at least one travelling casting belt for the production of metal strips and rods. 4,964,456, Cl. 164-481.000.
Laug, Owen B., to United States of America, Commerce. High current, very wide band transconductance amplifier. 4,965,529, Cl. 330-255.000.
Launay, Francis A. P.: *See*—
Guibert, Paul; and Launay, Francis A. P., 4,964,902, Cl. 65-71.000.
Lautenschlaeger, Friedrich K. W.; Bumanlag, Reynaldo G.; and Box, James A., to B. F. Goodrich Company, The. Adhesive composition, process, and product. 4,965,117, Cl. 428-182.000.
Lauterbach, Gerald: *See*—
Huellmann, Michael; Becker, Rainer; Lauterbach, Gerald; Buschmann, Ernst; Eckhardt, Heinz; Himmele, Walter; and Brueckner, Christiane, 4,965,376, Cl. 549-423.000.
Lauterbach, Heinz: *See*—
Schueler, Hans; Lauterbach, Heinz; Tschoeke, Helmut; Kinzel, Richard; and Stipek, Theodor, 4,964,789, Cl. 417-494.000.
Lawn, Richard M.: *See*—
Capon, Daniel J.; Lawn, Richard M.; Levinson, Arthur D.; Vehar, Gordon A.; and Wood, William I., 4,965,199, Cl. 435-69.600.
Lawrence, W. Edward. Removable extension for a hydraulic floor jack. 4,964,617, Cl. 254-8.00B.
Lazarus, Charles R., to Haarmann & Reimer Corporation. Dry mix suitable for the preparation of a puffable food product, processes for the use thereof, and the puffable and/or puffed foods products so produced. 4,965,081, Cl. 426-242.000.
Lazzara, Samuel P.: *See*—
Kahrilas, Peter J.; Miller, Thomas W.; and Lazzara, Samuel P., 4,965,602, Cl. 342-372.000.
Leahey, Edward; Zinner, Alexander J., III; and Howard, Christopher A., to Coherent Systems, Inc. Time period and heart rate measurement system. 4,964,410, Cl. 128-696.000.
Leath, E. L. "Buddy", to Chemical Reclamation Services, Inc. Method for disposing of hazardous waste material while producing a reusable by-product. 4,964,914, Cl. 106-745.000.
Ledinek, Pavel. Machine for surface and thickness working of short and thin workpieces. 4,964,446, Cl. 144-114.00R.
Lee, Benedict M.; and Harris, James E., to Eastman Kodak Company. Tobacco smoke filters and process for production thereof. 4,964,426, Cl. 131-342.000.
Lee, Chi-long: *See*—
Baney, Ronald H.; Bilgrien, Carl J.; Fiedler, Lawrence D.; and Lee, Chi-long, 4,965,367, Cl. 548-110.000.
Lee, Harry E., Jr., to Engineering & Precision Machining, Inc. Method of forming a beaded transfixion wire. 4,964,320, Cl. 82-1.110.
Lee, Heyung-Sub: *See*—
Choi, Kyu H.; Lee, Jung H.; Lee, Heyung-Sub; Yook, Tae-Yoon; and Bae, Dong-Joo, 4,965,214, Cl. 437-24.000.
Lee, Jung H.: *See*—
Choi, Kyu H.; Lee, Jung H.; Lee, Heyung-Sub; Yook, Tae-Yoon; and Bae, Dong-Joo, 4,965,214, Cl. 437-24.000.
Lee, Neville K. S.; and Howard, James, to Digital Equipment Corporation. Magneto-optical data recording device using a wavelength and polarization-sensitive splitter. 4,965,780, Cl. 369-13.000.
Lee, San F. Insulated cup holder with flexible base member. 4,964,600, Cl. 248-146.000.
Leeson, Lewis J., to Ciba-Geigy Corporation. Method of treating memory impairment. 4,965,074, Cl. 424-449.000.
Lefebvre, Claude, to Institut Francais du Petrole. Method and device for regulating a controlled ignition engine from the statistic distribution of an angular divergence. 4,964,388, Cl. 123-435.000.
Legierse, Petrus E. J.; Beckers, Louis J. M.; and Landsbergen, Jeroen F. M., to Philips & Du Pont Optical Company. Method of producing a metal matrix. 4,964,958, Cl. 204-5.000.
Lehn, Chris F., to Ecolab Inc. Chemical solution dispenser apparatus and method of using. 4,964,185, Cl. 8-158.000.
Leiber, Hans-Jurgen; Meyer, Jean-Philippe; and Kummer, Christian F., to Kummer Freres Sa Fabrique de Machines. Ball turner for turning lathes. 4,964,321, Cl. 82-12.000.
Leigh, Arthur G.; and Wraige, Douglas, to Unilever Patent Holdings B.V. Conditioning of fabrics. 4,965,100, Cl. 427-242.000.
Leiner, Dennis C. Disposable rigid endoscope. 4,964,710, Cl. 350-572.000.
Leininger, James C., to Phillips Petroleum Company. Stabilization of polyolefins. 4,965,301, Cl. 524-101.000.
Leising, Maurice B.; Benford, Howard L.; Lindsay, Michael R.; and McCombie, Jay C., to Chrysler Corporation. Method of adaptively idling an electronic automatic transmission system. 4,965,728, Cl. 364-424.100.
Leising, Maurice B.: *See*—
Benford, Howard L.; Leising, Maurice B.; and Holbrook, Gerald L., 4,964,506, Cl. 192-106.00F.
Holbrook, Gerald L.; and Leising, Maurice B., 4,965,735, Cl. 364-424.100.
Leitz, Edgar: *See*—
Eichenauer, Herbert; Leitz, Edgar; and Ott, Karl-Heinz, 4,965,300, Cl. 525-415.000.
Leitz, Ludwig. Method for combining individual road-transport with rail-bound train-transport, and apparatus for implementing the method. 4,964,767, Cl. 410-65.000.
Leland Stanford Junior University, The Board of Trustees of the: *See*—
Roy, Richard H., III; Paulraj, Arogyaswami J.; and Kailath, Thomas, 4,965,732, Cl. 364-460.000.
Le Mehaute, Alain; Quiniou, Jean-Francois; Roques-Carmes, Claude; Wehbi, Dalloul; and Derossis, Antoine, to Compagnie Generale d'Electricite. Recursive-type periodic temporal signal generator. 4,965,746, Cl. 364-518.000.
Lemelshtrich, Noam. Rotary sprinkler. 4,964,572, Cl. 239-230.000.
Lemelson, Jerome H. Apparatus and method for coding and reading codes. 4,965,829, Cl. 382-1.000.
Lenhardt Padro, Carlos E.: *See*—
Cabre Castellvi, Juan; Diago Meseguer, Jose ; Esteve Bianchini, Asuncion; Lenhardt Padro, Carlos E.; and Sans Pitarch, Esteve, 4,965,358, Cl. 544-357.000.
Lenig, Ronald S.: *See*—
Jorden, Ralph Z.; and Lenig, Ronald S., 4,965,699, Cl. 361-387.000.
Lenormand, Regis; Billand, Marcel; Fraise, Pierre; Goupil, Jean-Claude; Raguenet, Gerard; and Rene, Didier, to Societe Anonyme dite: Alcatel Espace. Antenna which is electronically reconfigurable in transmission. 4,965,587, Cl. 342-372.000.

Lenormand, Regis; Clerino, Antoine; Neron, Jacques; Marre, Jean-Philippe; and Raguenet, Gerard, to Societe Anonyme dite : Alcatel Espace. Electronically scanned antenna. 4,965,588, Cl. 342-372.000.
Leonard, John F.; and Hager, Brian G., to United States of America, Air Force. Unidirectional heat pipe and wick. 4,964,457, Cl. 165-32.000.
Lepere, Guy; Kunegel, Jacques; and Coulmier, Jean-Pol, to Thomson CSF. Device for moving-clutter elimination in a radar. 4,965,585, Cl. 342-160.000.
Lepere, Guy: *See*—
Coulmier, Jean-Pol; Lepere, Guy; and Kunegel, Jacques, 4,965,584, Cl. 342-159.000.
Lerch, Rolf, to Maschinenfabrik Goebel GmbH. Releasable holding device for cores. 4,964,586, Cl. 242-72.00R.
LeStrange, Raymond J., to Du Pont de Nemours, E. I., and Company. Silver halide emulsions with improved speed. 4,965,184, Cl. 430-603.000.
Leveque, Alain; and Fitoussi, Richard, to Rhone-Poulenc Chimie. Liquid/liquid extraction of rare earth/cobalt values. 4,964,996, Cl. 210-634.000.
Leveque, Alain; Fitoussi, Richard; and Sabot, Jean-Louis, to Rhone-Poulenc Chimie. Liquid/liquid extraction of rare earth/cobalt values. 4,964,997, Cl. 210-634.000.
Lever Brothers Company: *See*—
Duffin, Bryan; and Haq, Zia, 4,964,873, Cl. 8-137.000.
Heybourne, Michael J. H.; Knight, Peter C.; Malguzzin, Antonio; Miotti, Daniele; and Travill, Andrew W., deceased, 4,965,015, Cl. 252-174.250.
Levinson, Arthur D.; and Simonsen, Christian, to Genentech, Inc. Polycistronic expression vector construction. 4,965,196, Cl. 435-691.000.
Levinson, Arthur D.: *See*—
Capon, Daniel J.; Lawn, Richard M.; Levinson, Arthur D.; Vehar, Gordon A.; and Wood, William I., 4,965,199, Cl. 435-69.600.
Lew-Mor, Inc.: *See*—
Lewis, William F.; and Moore, Bert R., 4,964,755, Cl. 404-25.000.
Lewis, Doris. Fitted top and bottom bedsheet combination. 4,964,184, Cl. 5-496.000.
Lewis, Roy G., to Henkel Corporation. Process of extraction of gallium from aqueous solutions thereof. 4,965,054, Cl. 423-112.000.
Lewis, William F.; and Moore, Bert R., to Lew-Mor, Inc. Manhole cover lock apparatus. 4,964,755, Cl. 404-25.000.
Lewon, Wilhelm: *See*—
Knoll, Randall L.; Aysta, James E.; and Lewon, Wilhelm, 4,964,206, Cl. 29-424.000.
Libbey-Owens-Ford Co.: *See*—
Weaver, William R.; and Matzinger, James E., 4,965,037, Cl. 264-511.000.
Licentia-Patent-Verwaltungs-GmbH: *See*—
Goldkuhle, Gerhard; and Sussnapp, Gunter, 4,964,982, Cl. 209-539.000.
Lidy, Werner A.; and Tenhagen, Rudolf J., to Polyol International BV. Process for preparing polyurethane foams having zones of differing hardness. 4,965,029, Cl. 264-45.100.
Lieb, Folker: *See*—
Boshagen, Horst; Rosentreter, Ulrich; Lieb, Folker; Oediger, Hermann; Seuter, Friedel; Perzborn, Elisabeth; and Fiedler, Volker-Bernd, 4,965,258, Cl. 514-158.000.
Liebl, Wolfgang; and Sinskey, Anthony J., to Massachusetts Institute of Technology. Coryneform expression and secretion system. 4,965,197, Cl. 435-69.800.
Liegeois, David D.: *See*—
Hubbell, James C.; Stiller, Gordon L.; and Liegeois, David D., 4,964,454, Cl. 164-246.000.
Ligneel, Roger: *See*—
Tacq, Jo; Ligneel, Roger; and Shaw, Henry, 4,964,442, Cl. 139-452.000.
Lillig, John E.; Whelan, Michael J.; Cheon, Thomas V.; Sisson, Patricia A.; and Flores, Orlando, to Beckman Instruments, Inc. Modular analyzer system. 4,965,049, Cl. 422-68.100.
Lin, Jangkeng: *See*—
Jeng, Bor-Shenn; Chang, Gan-How; Chang, Kuang-Yao; Liu, Jsann-Shyong; Lin, Jangkeng; Hwang, Jei-Shoung; Wu, T-Min; Shyu, Keh-Hwa; Miou, Char-Hin; and Can, Luke, 4,965,458, Cl. 364-419.000.
Lin, Joseph T., to Conner Peripherals, Inc. Stabilized disk drive spin motor. 4,965,476, Cl. 310-51.000.
Lin, Rueysen: *See*—
Polzin, R. Stephen; Niles, Roger G.; and Lin, Rueysen, 4,965,793, Cl. 370-94.100.
Lin, Wen-Tsung. Electronic badge having double-effect pins. 4,965,705, Cl. 362-103.000.
Lina, Jean P., to Valois (Societe Anonyme). Manually-operated pre-compression type spray head. 4,964,547, Cl. 222-385.000.
Lincoln Mills, Inc.: *See*—
Laico, Joseph P.; and Molino, Joseph L., 4,964,400, Cl. 128-75.000.
Lindberg, Per L.: *See*—
Brandstrom, Arne E.; Lindberg, Per L.; Starke, Carl I.; and Sunden, Gunnel E., 4,965,269, Cl. 514-253.000.
Lindberg, Thomas J.: *See*—
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Linde Aktiengesellschaft: *See*—
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Linder, Kurt; and Gurny, Werner, to Wegu-Messtechnik GmbH. Dynamic feeler head. 4,964,223, Cl. 33-556.000.
Lindhard, Gordon: *See*—
Wisneski, Leonard J., Jr.; and Lindhard, Gordon, 4,965,494, Cl. 315-241.00S.
Lindroos, Helge, to Flygt AB. Cable entry connection of an electric power cable to a submersible machine. 4,965,409, Cl. 174-65.0SS.
Lindsay, David S.; and Geyer, Calvin J. Electrical conductor of high magnetic permeability material for audio circuits. 4,964,738, Cl. 381-97.000.
Lindsay, Michael R.: *See*—
Leising, Maurice B.; Benford, Howard L.; Lindsay, Michael R.; and McCombie, Jay C., 4,965,728, Cl. 364-424.100.
Lindsay, Richard A., to Vinten Group plc. Height adjustable platforms. 4,964,607, Cl. 248-421.000.
Ling, Peter P. T.: *See*—
Ng, Andrew S. O.; and Ling, Peter P. T., 4,965,144, Cl. 429-55.000.
Lingnau, Juergen: *See*—
Vicari, Richard; Aslam, Mohammad; Ray, Wilson B.; Davenport, Kenneth G.; Dammel, Ralph; Lingnau, Juergen; and Doessel, Karl-Friedrich, 4,965,400, Cl. 560-130.000.
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Piunno, Carmen; Livesey, Stephen; Linner, John G.; del Campo, Anthony A.; and Zaltzberg, Mark J., 4,964,280, Cl. 62-78.000.
Lioy, Daniel C.; Hurtubis, Edward F.; and Schickler, Edward R., to Eastman Kodak Company. Aluminum shot blasted web conveying roller. 4,964,203, Cl. 29-121.800.
Lipatov, Viktor A.: *See*—
Kanshin, Nikolai N.; Lipatov, Viktor A.; and Guskov, Igor A., 4,964,863, Cl. 606-153.000.
Lipski, Pinchas. Showerhead adaptor means. 4,964,573, Cl. 239-283.000.
Lischynsky, Steve J.: *See*—
Caldwell, Kevin G.; Lischynsky, Steve J.; and Seregelyi, Elza V., 4,964,688, Cl. 350-96.200.
Liss, Theodor A.; and Beck, Leonard H., to Du Pont de Nemours, E. I., and Company. Stain resistant polymers & textiles. 4,965,325, Cl. 525-508.000.
Litz, Lawrence M., to Union Carbide Industrial Gases Technology Corporation. Process for dissolving a gas in a liquid. 4,965,022, Cl. 261-36.100.
Liu, Gang; Huang, Hanchi; Siy, Pepe; and Polis, Michael P., to Board of Governors of Wayne State University, The. N-bit A/D converter utilizing N comparators. 4,965,579, Cl. 341-159.000.
Liu, Jsann-Shyong: *See*—
Jeng, Bor-Shenn; Chang, Gan-How; Chang, Kuang-Yao; Liu, Jsann-Shyong; Lin, Jangkeng; Hwang, Jei-Shoung; Wu, T-Min; Shyu, Keh-Hwa; Miou, Char-Hin; and Can, Luke, 4,965,458, Cl. 364-419.000.
Liu, Miu-Tsu. Pressure driving cut-off type manometer. 4,965,422, Cl. 200-83.00S.
Livesey, Stephen: *See*—
Piunno, Carmen; Livesey, Stephen; Linner, John G.; del Campo, Anthony A.; and Zaltzberg, Mark J., 4,964,280, Cl. 62-78.000.
Livny, Michael, to Advanced Computerized Systems Medical, Ltd. Orthopedic diaper device. 4,964,858, Cl. 604-385.100.
Ljungstrom, Tommy: *See*—
Hanerus, Goran; and Ljungstrom, Tommy, 4,964,444, Cl. 141-90.000.
Lloyd, Kerry W. Method and apparatus for cleaning chimneys. 4,964,921, Cl. 134-21.000.
Lobe, Henry J. Sailboard fin retaining member. 4,964,826, Cl. 441-79.000.
Lochead, Alan: *See*—
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Lodhie, Qamar: *See*—
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Loeffler, Hermann, to BASF Aktiengesellschaft. Solvent azo dyes having carboxylic acid functions. 4,965,345, Cl. 534-651.000.
Loeffler, Hermann: *See*—
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Loeffler, William F., to Cleveland Steel Specialty Company. Multiple truss hanger connector. 4,964,253, Cl. 52-289.000.
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Hanna, Emmanuel A.; and Loewenthal, Henry J., 4,964,544, Cl. 222-181.000.
Logman, Timothy M., to Mueller Co. Gate valve. 4,964,613, Cl. 251-267.000.
Lombard, Emile. Hanging bracket for curtain rods. 4,964,604, Cl. 248-262.000.
Long, Russell L.; and Hart, James D., to Trinity Industries, Inc. Side panel assembly for an auto rack car. 4,964,347, Cl. 105-404.000.
Long, Wayne H.; and Wardlaw, Francis M., Jr., to Milliken Research Corporation. Foam cleaner for loom reeds. 4,964,441, Cl. 139-1.00C.
Longview Corporation: *See*—
Kamille, Stuart J., 4,964,642, Cl. 273-240.000.
Lonza Ltd.: *See*—
Gosteli, Jacques; and Warm, Aleksander, 4,965,359, Cl. 546-114.000.
Lord Corporation: *See*—
Thorn, Richard P., 4,964,516, Cl. 267-140.100.
Thorn, Richard P., 4,964,623, Cl. 267-140.100.
L'Oreal: *See*—
Gueret, Jean-Louis, 4,964,541, Cl. 222-137.000.

Losada, Robert J.; and Conway, Hugh T., to Becton, Dickinson and Company. Flow inducing means for small volume containers. 4,964,413, Cl. 128-766.000.

Lott, John W.; Poulin, Thomas R.; and Wallace, Patrick W., to Du Pont de Nemours, E. I., and Company. Chip carrier package and method of manufacture. 4,965,702, Cl. 361-401.000.

Louis, Jean-Marie W. Light assembly having a magnetized base. 4,965,708, Cl. 362-398.000.

Lowrie, Harman S.: *See*—
Baran, John S.; Lindberg, Thomas J.; and Lowrie, Harman S., 4,965,373, Cl. 549-273.000.

Lowther, Frank E.; and Bohon, William M., to Atlantic Richfield Company. Integrated product generation and catalytic product synthesis in an engine-reactor. 4,965,052, Cl. 422-187.000.

Loyd, Thomas D. Laser disk retaining case. 4,964,510, Cl. 206-306.000.

Lu, Sun: *See*—
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Lubke, Allen: *See*—
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Lubowitz, Hyman R.; and Sheppard, Clyde H., to Boeing Company, The. High performance heterocycle oligomers and blends. 4,965,336, Cl. 528-170.000.

Lucas Industries Public Limited Co.: *See*—
Rath, Heinrich-Bernhard, 4,964,679, Cl. 303-100.000.

Lucas, Keith, to Scientific-Atlanta, Inc. Method and apparatus for increasing the definiton of an NTSC video signal using an augmentation channel. 4,965,661, Cl. 358-12.000.

Luchko, Nina A.: *See*—
Grischenko, Valentin I.; Kalugin, Jury V.; Luchko, Nina A.; and Chernysh, Elena N., 4,965,185, Cl. 435-1.000.
Grischenko, Valentin I.; Kalugin, Jury V.; Paraschuk, Jury S.; Luchko, Nina A.; Chernysh, Elena N.; Tarasov, Valery F.; and Galchenko, Sergei E., 4,965,186, Cl. 435-2.000.

Luetzelschwab, Wayne E., to Marathon Oil Company. Preparation and cooling of aqueous polymer solution. 4,965,298, Cl. 523-306.000.

Luft, Gerhard; and Trabold, Peter, to Hoechst Aktiengesellschaft. Supported catalyst for the preparation of monocarboxylic anhydrides. 4,965,234, Cl. 502-154.000.

Luk Lamellen und Kupplungsbau GmbH: *See*—
Friedmann, Oswald, 4,964,504, Cl. 192-48.400.

Lukacsko, Alison B.; and Koslo, Randy J., to Bristol-Myers Squibb Company. Gastroprotective process and compositions. 4,965,065, Cl. 424-10.000.

Lumonics Material Processing Corporation: *See*—
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Lund, Wesley C.: *See*—
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Lunkenheimer, Winfried: *See*—
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Luper, Paulette: *See*—
Geissberger, Arthur E.; Sadler, Robert A.; Luper, Paulette; and Balzan, Matthew L., 4,965,218, Cl. 437-41.000.

Lupton, Stephen D.: *See*—
Namen, Anthony E.; Goodwin, Raymond G.; Lupton, Stephen D.; and Mochizuki, Diane Y., 4,965,195, Cl. 435-69.520.

Lupyan, David A.: *See*—
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Luther Medical Products, Inc.: *See*—
Luther, Ronald B., 4,964,854, Cl. 604-166.000.

Luther, Ronald B., to Luther Medical Products, Inc. Intravascular catheter assembly incorporating needle tip shielding cap. 4,964,854, Cl. 604-166.000.

Lutron Electronics Co., Inc.: *See*—
Oldham, David J., 4,965,509, Cl. 323-300.000.

Lutz, Rolf; Reinalter, Franz; and Fiechtner, Heinz, to Zahnradfabrik Friedrichshafen AG. Locking synchronizing means for transmisson shifts. 4,964,505, Cl. 192-53.00F.

Lydtin, Hans-Jurgen: *See*—
Gartner, Georg F.; Janiel, Peter A.; and Lydtin, Hans-Jurgen, 4,965,090, Cl. 427-39.000.

Lyons, Michael R.: *See*—
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Lysaght, Michael J.; Boggs, Daniel R.; and Ritger, Philip L. Optimized filter and method. 4,964,976, Cl. 210-650.000.

Lysen, Claes G., to Kamyr AB. Chip level indicator with differential transformer. 4,964,301, Cl. 73-290.00R.

M. A. Industries Ltd.: *See*—
Alpert, Mayer, 4,964,181, Cl. 4-597.000.

MacKenzie, Simon A.: *See*—
Okura, David K.; Gauthier, John A.; Hill, Trevor R.; and MacKenzie, Simon A., 4,965,884, Cl. 375-106.000.

Macune, Don T.: *See*—
Hazen, Gary A.; and Macune, Don T., 4,965,522, Cl. 324-339.000.

Maeda, Tetsuro; and Okamoto, Akihiro, to Denki Kagaku Kogyo Kabushiki Kaisha. Thermoplastic resin composition. 4,965,315, Cl. 525-86.000.

Maeda, Toshihiko; and Yoshimura, Noriaki, to Kuraray Company, Ltd. Process for the preparation of lithium diphenylphosphinobenzene-m-monosulfonate. 4,965,404, Cl. 562-35.000.

Maeda, Toshimasa; and Sato, Hidenobu, to Mazda Motor Corporation. Automobile engine cooling system. 4,964,371, Cl. 123-41.100.

Maehata, Shigeki: *See*—
Yanaki, Toshio; Maehata, Shigeki; Satoh, Tomoko; and Ikeda, Shinji, 4,965,354, Cl. 536-124.000.

Maertens, Michael J., to Tecumseh Products Company. Compressor mounting apparatus. 4,964,786, Cl. 417-363.000.

Maes, Roland F., to Anda Biologicals. A60-antigen from Mycobacteria and use thereof as tuberculin and as vaccine. 4,965,192, Cl. 435-7.000.

Maetzel, Uwe; and Heitmann, Walter, to Kali-Chemie Pharma GmbH. Method for preparing indole carboxylic acid derivatives. 4,965,369, Cl. 548-492.000.

Magdo, Ingrid E.; and Magdo, Steven, to International Business Machines Corporation. Dielectric isolation for high density semiconductor devices. 4,965,652, Cl. 352-50.000.

Magdo, Steven: *See*—
Magdo, Ingrid E.; and Magdo, Steven, 4,965,652, Cl. 352-50.000.

Maggioni, Virginio; and Torrielli, Vittorino, to Fiat Auto S.p.A. Electromagnetically-operated rotary servovalve. 4,964,612, Cl. 251-129.090.

Magnavox Government and Industrial Electronics Company: *See*—
Jorden, Ralph Z.; and Lenig, Ronald S., 4,965,699, Cl. 361-387.000.

Mahmud, Nargis A., to Nashua Corporation. Non-crosslinked electrographic copolymer composition and imaging process. 4,965,161, Cl. 430-109.000.

Mai, Dieter, to Veit GmbH & Co. Guide rail supported seam ironing apparatus. 4,964,230, Cl. 38-1.00B.

Maier, Manfred; Ruppert, Franz; and Schwab, Joachim, to Gebr. Hofmann GmbH & Co. KG. Apparatus for measuring, in a tire testing machine, radial and axial forces at a wheel consisting of a pneumatic tire and a rim. 4,964,299, Cl. 73-146.000.

Maine, Reuben E., to Sperry Marine Inc. Code tracking apparatus with improved resolution for spread spectrum receiver. 4,965,808, Cl. 375-1.000.

Mainland, Donald R.; and Sprangers, Keith J., to U. S. Competition Arms, Inc. Single barrel break-action trap shotgun. 4,964,232, Cl. 42-44.000.

Malguzzin, Antonio: *See*—
Heybourne, Michael J. H.; Knight, Peter C.; Malguzzin, Antonio; Miotti, Daniele; and Travill, Andrew W., deceased, 4,965,015, Cl. 252-174.250.

Malin, Jane T.; Basham, Bryan D.; and Harris, Richard A., to United States of America, National Aeronautics and Space Administration. Discrete event simulation tool for analysis of qualitative models of continuous processing system. 4,965,743, Cl. 364-513.000.

Mallett, James A.: *See*—
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Malootian, Markay: *See*—
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Malotke, Timothy P.; Kappel, Glendon D.; and Marohl, Charles H., to NCR Corporation. Retaining bar for printed wiring cards. 4,964,810, Cl. 439-368.000.

Man Roland Druckmaschinen AG: *See*—
Bock, Georg; Gollinger, Franz X.; and John, Thomas, 4,964,336, Cl. 101-157.000.

Mandell, Gerald L.; Sullivan, Gail W.; and Novick, William J., to Hoechst Roussel Pharmaceuticals, Inc.; and University of Virginia. Method of inhibiting the activity of leukocyte derived cytokines. 4,965,271, Cl. 514-263.000.

Mandish, John J.: *See*—
Iftikar, Syed H.; and Mandish, John J., 4,965,691, Cl. 360-133.000.

Manduch, Frank J.: *See*—
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Manganese Bronze Limited: *See*—
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Manku, Mehar S.: *See*—
Horrobin, David F.; Cunnane, Stephen C.; and Manku, Mehar S., 4,965,075, Cl. 424-638.000.

Manno, Eugene; and Mestnik, Joseph G., to Xerox Corporation. Toner supply cartridge for reproduction and printing machines. 4,965,639, Cl. 355-260.000.

Mano, Hiroyuki; Kinugawa, Kiyoshige; and Tsunekawa, Satoru, to Hitachi, Ltd. Flat display driving circuit for a display containing margins. 4,965,563, Cl. 340-784.000.

Manzone, Jean-Michel: *See*—
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Marangone, Nereo: *See*—
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Marano, Walter. Portable exercising set. 4,964,631, Cl. 272-117.000.

Marathon Oil Company: *See*—
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Marelli Autronica S.p.A.: *See*—
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Marelli Autronics S.p.A.: *See*—
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Marietta, Walter E., to Sta-Rite Industries, Inc. Rotary valve. 4,964,433, Cl. 137-115.000.

Markle, David A., to General Signal Corporation. Unit magnification optical system. 4,964,705, Cl. 350-442.000.
Marko, Istvan E.; and Sharpless, K. Barry, to Massachusetts Institute of Technology. Ligand-accelerated catalytic asymmetric dihydroxylation. 4,965,364, Cl. 546-134.000.
Marlboro Marketing, Inc.: *See*—
Morrow, Lester; and Kidd, R. Christopher, 4,964,546, Cl. 222-352.000.
Marohl, Charles H.: *See*—
Malotke, Timothy P.; Kappel, Glendon D.; and Marohl, Charles H., 4,964,810, Cl. 439-368.000.
Marquardt, Rudiger: *See*—
Muth, Gunter; Wohlleben, Wolfgang; Puhler, Alfred; Wohner, Gerhard; and Marquardt, Rudiger, 4,965,207, Cl. 435-320.000.
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Lenormand, Regis; Clerino, Antoine; Neron, Jacques; Marre, Jean-Philippe; and Raguenet, Gerard, 4,965,588, Cl. 342-372.000.
Marschall, Roland, to Prakla-Seismos AG. Method for recording seismic data. 4,965,773, Cl. 367-15.000.
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Stadler, Eberhard; Eger, Matthias; Melcher, Franz-Josef; and Martens, Veronika, 4,964,478, Cl. 177-229.000.
Martetschlager, Kurt: *See*—
Schermanz, Karl; Saischek, Gerald; Kores, Dietmar; Graf, Josef; Haas, Gerhard; and Martetschlager, Kurt, 4,965,277, Cl. 514-385.000.
Martin, August J.; and Mooi, Raymond, to Keebler Company. Shelf stable cookie. 4,965,076, Cl. 426-18.000.
Martin, August J.; and Furia, Thomas E., to Keebler Company. Shelf stable cookie. 4,965,077, Cl. 426-18.000.
Martin, Galen M.: *See*—
Hayes, Earl J., Sr.; Johnson, Daniel L.; and Martin, Galen M., 4,964,811, Cl. 439-398.000.
Martin, Harry W. Paint saver and can seal protector. 4,964,527, Cl. 220-90.000.
Martin, Linda M. Gloves for mechanics. 4,964,174, Cl. 2-161.00R.
Martin Marietta Energy Systems, Inc.: *See*—
Haynes, Howard D.; and Eissenberg, David M., 4,965,513, Cl. 324-158.0MG.
Martin Sprocket and Gear: *See*—
Howard, Billy G., 4,964,842, Cl. 474-152.000.
Martin, Stanley W.: *See*—
Sarkisian, Nancy L.; and Martin, Stanley W., 4,964,557, Cl. 226-18.000.
Martineau, Didier, to Alcatel N.V. Very low loss microwave modulator having two phase states O, π . 4,965,866, Cl. 333-164.000.
Martino, Philip C. Piston ring grinder. 4,964,240, Cl. 51-125.500.
Marui, Ltd.: *See*—
Marui, Shinji, 4,964,192, Cl. 16-111.00R.
Marui, Shinji, to Marui, Ltd. Multiple radius grip. 4,964,192, Cl. 16-111.00R.
Maruyama, Tsutomu; Fukawa, Kiyotake; Akiyama, Atsushi; and Kiyomura, Yoshihiro, to Kansai Paint Co., Ltd. Process for preparing the printed-circuit boards using a photosensitive composition containing a reduction type leico pigment. 4,965,073, Cl. 430-292.000.
Maruyama, Tsutomu; and Kobayashi, Koichi, to Sanyo Denki Co., Ltd. Flat frequency, constant voltage power source device. 4,965,463, Cl. 307-87.000.
Maruyama, Yutaka; Komoriya, Haruhiko; and Tsutsumi, Kentaro, to Central Glass Company, Limited. Method of preparing soluble aromatic polyimides and varnish compositions using same. 4,965,339, Cl. 528-353.000.
Marzio, Nocchi: *See*—
Giancarlo, Gazia; and Marzio, Nocchi, 4,964,178, Cl. 2-414.000.
Mas, Jean-Claude; and Mendiboure, Andre, to Societe Anonyme dite: CIPEL. Separator for an electrochemical cell of the metal-air type and having an alkaline electrolyte. 4,965,147, Cl. 429-136.000.
Masaki, Kenji: *See*—
Hotomi, Hideo; Masaki, Kenji; Iino, Shuji; Osawa, Izumi; Fujiwara, Masanori; and Doi, Isao, 4,965,156, Cl. 430-66.000.
Masaki, Kouichi; Kosha, Hideaki; Miura, Toshihiko; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium and the method for preparing the same. 4,965,125, Cl. 428-329.000.
Maschinenfabrik Bezner GmbH & Co. KG: *See*—
Kopp, Wilhelm, 4,964,577, Cl. 241-24.000.
Maschinenfabrik Goebel GmbH: *See*—
Lerch, Rolf, 4,964,586, Cl. 242-72.00R.
Maschinenfabrik Rieter AG: *See*—
Oehy, Peter; Brennwalder, Daniel; and Bachmann, Othmar, 4,964,267, Cl. 57-22.000.
Schmid, Renacu/e/ ; and Koller, Jurg, 4,964,196, Cl. 19-200.000.
Mason, Michael S. Microscope for medical surgery. 4,964,708, Cl. 350-519.000.
Mason, Michael W.: *See*—
Gipson, William P.; Mason, Michael W.; and Hensler, Thomas A., 4,964,860, Cl. 604-391.000.
Mass Market Sales, Inc.: *See*—
Bagley, Bruce, 4,965,424, Cl. 219-10.55E.
Mass-Set Kabushiki Kaisha: *See*—
Suzuki, Toshio, 4,964,833, Cl. 446-118.000.
Massachusetts Institute of Technology: *See*—
Girod, Bernd; and Adelson, Edward H., 4,965,442, Cl. 250-201.700.
Liebl, Wolfgang; and Sinskey, Anthony J., 4,965,197, Cl. 435-69.800.
Marko, Istvan E.; and Sharpless, K. Barry, 4,965,364, Cl. 546-134.000.
Massie, Philip E. Foot-operated control. 4,965,417, Cl. 200-86.500.
Masten, Michael M.: *See*—
Parshotam, Mahesh; Howard, Alan D.; Traulsen, Robert D.; Pennock, James L.; Hoo, James W.; and Masten, Michael M., 4,965,516, Cl. 324-158.00R.
Masuda, Kenichi: *See*—
Inoue, Hideo; Ohtsuka, Eiko; Imura, Akihiro; Masuda, Kenichi; and Kamimura, Takashi, 4,965,350, Cl. 536-28.000.
Matherly, James F.: *See*—
Pugh, J. Robert; and Matherly, James F., 4,964,566, Cl. 236-49.300.
Mathews, Harlan P., to Storage Technology Partners II. Off-track bit shift compensation apparatus. 4,965,782, Cl. 369-48.000.
Matrick, Howard, to Du Pont de Nemours, E. I., and Company. Humidity-resistant proofing toners with low molecular weight polystyrene. 4,965,172, Cl. 430-291.000.
Matsubara, Hisayoshi: *See*—
Mizuno, Yutaka; Hanajima, Toshiharu; and Matsubara, Hisayoshi, 4,965,143, Cl. 429-17.000.
Matsubara, Takashi, to Nikon Corporation. Plate for light shielding blade. 4,965,617, Cl. 354-246.000.
Matsuda, Minoru, to Chisso Corporation. Copolymer from sulfur dioxide and vinyl compound. 4,965,340, Cl. 528-382.000.
Matsuda, Toshihiko: *See*—
Ueda, Shigeta; Honda, Kazuo; Ikimi, Takashi; Matsuda, Toshihiko; Nagase, Hiroshi; and Mutoh, Nobuyoshi, 4,965,504, Cl. 318-802.000.
Matsuda, Toshio: *See*—
Kawabata, Toshiharu; Koike, Susumu; Matsuda, Toshio; and Iwasa, Hitoo, 4,965,644, Cl. 357-17.000.
Matsumoto, Atsuo: *See*—
Nokubo, Seiji; Kohno, Teruhisa; Hashida, Koichi; Matsumoto, Atsuo; and Higashimura, Hideaki, 4,964,680, Cl. 303-115.000.
Matsumoto, Koichi: *See*—
Kato, Kinya; Ushida, Kazuo; Namikawa, Toshiyuki; Matsumoto, Koichi; Suwa, Kyoichi; and Ohno, Koichi, 4,965,630, Cl. 355-52.000.
Matsumoto, Yasuo: *See*—
Takeyama, Satoshi; and Matsumoto, Yasuo, 4,964,375, Cl. 123-315.000.
Matsumoto, Yumio: *See*—
Sangyoji, Kazuo; Yamamoto, Takemi; Hatta, Naoyuki; Sakakibara, Kenji; Asano, Yuji; Hara, Yoshimasa; Matsumoto, Yumio; and Hayakawa, Kiyoharu, 4,965,592, Cl. 346-110.00R.
Matsumura, Yasuo: *See*—
Nagatsuka, Ikutaroh; Matsumura, Yasuo; Takeda, Masayuki; Suzuki, Chiaki; and Aoki, Takayoshi, 4,965,160, Cl. 430-108.000.
Matsuo, Shigeru; Katsura, Koyo; Sato, Jun; Sone, Takashi; and Yokoyama, Masakatu, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Graphic processor suitable for graphic data transfer and conversion processes. 4,965,750, Cl. 364-521.000.
Matsurra, Hideaki: *See*—
Yuyama, Masahiro; Koyama, Teruhisa; Matsurra, Hideaki; and Date, Shinji, 4,965,321, Cl. 525-329.700.
Matsushita Electric Industrial Co., Ltd.: *See*—
Ashihara, Ryohei; Suehiro, Kikumitsu; Yabuta, Masayuki; and Yamagishi, Hideaki, 4,965,149, Cl. 429-168.000.
Daio, Fumio; Niwa, Yukimasa; and Yoshida, Kenji, 4,965,148, Cl. 429-159.000.
Inada, Masanori; Eda, Kazuo; Ota, Yorito; Nakagawa, Atsushi; and Yanagihara, Manabu, 4,965,650, Cl. 357-34.000.
Kawabata, Toshiharu; Koike, Susumu; Matsuda, Toshio; and Iwasa, Hitoo, 4,965,644, Cl. 357-17.000.
Murata, Yoshitaka; and Kawakami, Hiroshi, 4,964,190, Cl. 15-369.000.
Nishino, Atsushi; Mizuno, Yasuo; Ikeda, Masaki; and Hiraka, Masahiro, 4,965,229, Cl. 301-14.000.
Nomura, Shoichi; Kitagawa, Akira; Kawanishi, Hidekata; and Shibata, Tsuneo, 4,965,434, Cl. 392-407.000.
Takada, Kazunori; Yamamura, Yasuharu; and Kondo, Shigeo, 4,965,151, Cl. 429-191.000.
Yoshino, Tuyoshi, 4,965,688, Cl. 360-118.000.
Matsushita Electric Works, Ltd.: *See*—
Aoki, Kazuhisa, 4,965,693, Cl. 361-42.000.
Nobutani, Tohru; Nakamoto, Atsuhiro; Izumi, Hideo; and Miyano, Takahiro, 4,964,962, Cl. 204-192.300.
Matsushita Graphic Communication Systems, Inc.: *See*—
Ohigashi, Chiaki; Iemura, Shigeru; Shimamura, Kazuhiro; and Tanaka, Tetsuo, 4,965,597, Cl. 346-157.000.
Matsushita, Kyozo, to Kabushiki-kaisha Toyo Seisakusho. Device for controlling the air pressure in the low pressure environmental testing chamber for self-propelled vehicles. 4,964,298, Cl. 73-117.100.
Matsushita, Narihiro: *See*—
Yokoe, Masaaki; Kurono, Yoshikazu; Hayashi, Koji; Takagi, Tomoe; Matsushita, Narihiro; and Takagi, Yuzo, 4,964,352, Cl. 112-103.000.
Mattson, Rodney A.: *See*—
Heuscher, Dominic J.; and Mattson, Rodney A., 4,965,726, Cl. 364-413.190.
Matuszak, Edward A.: *See*—
Chawan, Dhyaneshwar B.; Merritt, Carleton; and Matuszak, Edward A., 4,965,082, Cl. 426-331.000.
Matzinger, James E.: *See*—
Weaver, William R.; and Matzinger, James E., 4,965,037, Cl. 264-511.000.

Maugans, Rexford A.: *See*—
Im, Jang-bi; Maugans, Rexford A.; and Kiesel, David R., 4,965,135, Cl. 428-412.000.

Mauleon, Jean-Louis; Siguad, Jean-Bernard; Pontier, Renaud; and Hoffmann, Frederic, to Compagnie de Raffinage et de Distribution Total France; and Institut Francais du Petrole. Process for fluidized-bed catalyst regeneration. 4,965,232, Cl. 502-43.000.

Maurer, John J.: *See*—
Jones, Robert S.; and Maurer, John J., 4,965,621, Cl. 355-1.000.

Maus, Steven M.; and Galic, George J., to Galic/Maus Ventures. Method of injection molding thermoplastic through multiple gates. 4,965,028, Cl. 264-297.200.

May, Travill Rachel, legal representative: *See*—
Heybourne, Michael J. H.; Knight, Peter C.; Malguzzin, Antonio; Miotti, Daniele; and Travill, Andrew W., deceased, 4,965,015, Cl. 252-174.250.

Mazda Motor Corp.: *See*—
Fujii, Yoshio, 4,964,672, Cl. 296-192.000.
Maeda, Toshimasa; and Sato, Hidenobu, 4,964,371, Cl. 123-41.100.

Mazzucchelli, Carlo: *See*—
Vasconi, Enrico; Mazzucchelli, Carlo; Torriani, Diego; and Giganti, Mario, 4,965,848, Cl. 388-815.000.

McAteer, Jeffrey P.: *See*—
Elko, Gary W.; Kubli, Robert A.; McAteer, Jeffrey P.; and West, James E., 4,965,775, Cl. 367-119.000.

McBride, Donald G., to International Business Machines Corporation. Thin film package for mixed bonding of chips. 4,965,700, Cl. 361-398.000.

McCaleb, Frank D.; and Pagones, Basil, to Motorola, Inc. Lithium battery deactivator. 4,965,505, Cl. 320-13.000.

McCarthy, Alfred F., to Avvid Engineering, Inc. V-shaped clip for attaching a semiconductor device to a heat sink. 4,964,198, Cl. 24-458.000.

McCarthy, Terry B., to Amoco Corporation. Apparatus and process for stabilizing liquid hydrocarbon condensate. 4,964,980, Cl. 208-340.000.

McCombie, Jay C.: *See*—
Leising, Maurice B.; Benford, Howard L.; Lindsay, Michael R.; and McCombie, Jay C., 4,965,728, Cl. 364-424.100.

McCormick & Company, Inc.: *See*—
Kenyon, William B., Jr., 4,964,548, Cl. 222-521.000.

McCoy, William F.; and Thornburgh, Scott, to Great Lakes Chemical Corporation. Process of forming 2-(2-bromo-2-nitroethenyl)-furan. 4,965,377, Cl. 549-491.000.

McCracken, Robert G., to Economy Forms Corporation. Beam member for concrete forming system. 4,964,256, Cl. 52-726.000.

McCrary, Avis L.: *See*—
Bertram, James L.; Walker, Louis L.; McCrary, Avis L.; and Cortez, Fermin M., 4,965,324, Cl. 525-507.000.

McCullough, Francis P., Jr.; Cipriano, Robert A.; and Snelgrove, R. Vernon, to Dow Chemical Company, The. Molten membrane electrolyte battery. 4,965,146, Cl. 429-102.000.

McCutcheon, John R.: *See*—
Hull, Harold L.; and McCutcheon, John R., 4,964,644, Cl. 273-336.000.

McDaid, Denis. Telephone lock. 4,964,284, Cl. 70-14.000.

McDonald, Ian A.: *See*—
Palfreyman, Michael G.; Bey, Philippe; and McDonald, Ian A., 4,965,288, Cl. 514-649.000.

McDonald, Neil A., to General Electric Company, p.l.c., The. Authenticator. 4,965,827, Cl. 380-25.000.

McDonald Plumbing & Heating Inc.: *See*—
Gaulin, Donald, 4,964,470, Cl. 169-56.000.

McDonald, Randolph A.: *See*—
Brannen, William T.; Burt, Gerald D.; and McDonald, Randolph A., 4,965,002, Cl. 252-32.500.

McDonnell Douglas Corporation: *See*—
Van Hoogstrate, John A.; and Buchroeder, Richard A., 4,964,718, Cl. 353-31.000.

McFadden, Joseph T. Positioning device. 4,964,748, Cl. 403-55.000.

McGregor, Thomas; Wemyss, George A.; and Firth, Ian M. Voice enhancer system. 4,965,833, Cl. 381-83.000.

McKearn, Thomas J.: *See*—
Quash, Gerard A.; Rodwell, John D.; McKearn, Thomas J.; and Ripoll, Jean P., 4,965,069, Cl. 424-89.000.

McKeown, Patrick D.: *See*—
Kennedy, Charles G.; McKeown, Patrick D.; and Neiger, Jack W., 4,964,618, Cl. 256-24.000.

McKinney, Ira D.: *See*—
Land, Cecil E.; and McKinney, Ira D., 4,965,784, Cl. 369-100.000.

McKinney, Larry S.; and Pidgeon, Rezin E., Jr., to Scientific Atlanta. Channel frequency generator for use with a multi-frequency output generator. 4,965,534, Cl. 331-37.000.

McLaen, Donald F., to Eastman Kodak Company. Activator solution with cold image tone-providing agent. 4,965,177, Cl. 430-405.000.

McLaughlin, James R.: *See*—
Duke, Ronald J.; Lu, Sun; McLaughlin, James R.; and Walowit, Eric, 4,965,672, Cl. 358-298.000.

McMichael, Lan C.: *See*—
Hong, John H.; and McMichael, Lan C., 4,965,603, Cl. 342-372.000.

McNally, Michael H.: *See*—
Timm, Walter C.; and McNally, Michael H., 4,965,299, Cl. 523-437.000.

McNamara, John J.: *See*—
Weymouth, Russell F., Jr.; McNamara, John J.; and Cianfione, Joseph A., 4,964,714, Cl. 351-62.000.

McRoberts, George F., Jr.; and Moran, Thomas J. Automatic light-extinguishing circuit. 4,965,461, Cl. 307-10.800.

Mead Corporation, The: *See*—
Duke, Ronald J.; Lu, Sun; McLaughlin, James R.; and Walowit, Eric, 4,965,672, Cl. 358-298.000.
Saccocio, Edward J.; Varde, Uday; Hutchings, David A.; and Messer, Russell K., 4,965,165, Cl. 430-138.000.

Mead, Ralph T.: *See*—
Keister, Pamela P.; Mead, Ralph T.; Muffoletto, Barry C.; Takeuchi, Esther S.; Ebel, Steven J.; Zelinsky, Michael A.; and Greenwood, John M., 4,964,877, Cl. 29-623.100.

Measurex Corporation: *See*—
Balakrishnan, Ramesh, 4,965,736, Cl. 364-469.000.
Boissevain, Mathew G., 4,964,311, Cl. 74-110.000.

Medice Chem.-Pharm. Fabrik Putter GmbH & Co. KG: *See*—
Paradies, Henrich H., 4,965,357, Cl. 544-309.000.

Medina, John: *See*—
Helmling, Oswald; Arnold, G.; Rzehak, H.; Fahey, George C., Jr.; Berger, Larry L.; Merchen, Neal R.; Medina, John; and Moerck, Rudi, 4,965,086, Cl. 426-636.000.

Mee, John D.; and Munshi, Jal F., to Eastman Kodak Company. Trinuclear dyes for photographic compositions and method of preparation. 4,965,183, Cl. 430-578.000.

Meffert, Alfred: *See*—
Schmid, Karl-Heinz; Meffert, Alfred; Schenker, Gilbert; Asbeck, Adolf; and Geke, Juergen, 4,965,019, Cl. 252-321.000.

Mehesch, Hans E.: *See*—
Muller, Hanns P.; Kapps, Manfred; Vehlewald, Peter; Meyer, Frank; Cornely, Wolfgang; and Mehesch, Hans E., 4,965,292, Cl. 521-110.000.

Mehrotra, Pankaj K.; and Billman, Elizabeth R., to Kennametal Inc. Alumina-zirconia-silicon carbide-magnesia compositions and articles made therefrom. 4,965,231, Cl. 501-89.000.

Mehta, Nikhil A.: *See*—
Cutts, Richard W., Jr.; Mehta, Nikhil A.; and Jewett, Douglas E., 4,965,717, Cl. 364-200.000.

Meier, Erich: *See*—
Reuter, Knud; Freitag, Dieter; Weymans, Gunther; Dhein, Rolf; Meier, Erich; and Muller, Gerold, 4,964,890, Cl. 55-158.000.

Meier, Hans R.; and Evans, Samuel, to Ciba-Geigy Corporation. N-substituted tetrahydroquinolines for use as antioxidants in lubricants. 4,965,006, Cl. 252-50.000.

Meinherz, Manfred: *See*—
Chyla, Thomas; and Meinherz, Manfred, 4,965,419, Cl. 200-147.00R.

Meissner, Eckhard: *See*—
Auracher, Franz; Ebberg, Alfred; Noll, Bernd; Meissner, Eckhard; and Rodler, Hermann-Johann, 4,965,857, Cl. 455-618.000.

Melcher, Franz-Josef: *See*—
Stadler, Eberhard; Eger, Matthias; Melcher, Franz-Josef; and Martens, Veronika, 4,964,478, Cl. 177-229.000.

Melville, James E.: *See*—
Neal, Donald F.; Kearns, Michael W.; Fox, Stephen P.; Melville, James E.; Wright, Kenneth W.; Wood, Philip S.; Pinder, John T.; and Clark, Stephen C., 4,964,564, Cl. 228-107.000.

Melzer, Helmut L.: *See*—
Casey, Irene; and Melzer, Helmut L., 4,965,063, Cl. 424-7.100.

Menchen, Steven M.: *See*—
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Mendiboure, Andre: *See*—
Mas, Jean-Claude; and Mendiboure, Andre, 4,965,147, Cl. 429-136.000.

Menefee, Carol A.: *See*—
Lai, Vu A.; and Menefee, Carol A., 4,965,412, Cl. 174-107.000.

Menet, Jacques; and Comparat, Vincent, to Centre National de la Recherche Scientifique. Plasma generator. 4,965,491, Cl. 315-111.210.

Mente, Kurt; and Knitsch, Gerhard, to J.H. Benecke AG and Corovin GmbH. Apparatus for the production of non-woven material from endless filaments. 4,964,197, Cl. 19-299.000.

Menyhert, William R., to Security Tag Systems, Inc. Process for making secure paper product. 4,964,951, Cl. 162-140.000.

Merchant, James T.: *See*—
Genfan, German S., 4,964,357, Cl. 114-274.000.

Merchen, Neal R.: *See*—
Helmling, Oswald; Arnold, G.; Rzehak, H.; Fahey, George C., Jr.; Berger, Larry L.; Merchen, Neal R.; Medina, John; and Moerck, Rudi, 4,965,086, Cl. 426-636.000.

Merck & Co., Inc.: *See*—
Chen, Shieh-Shung J.; and Arison, Byron H., 4,965,200, Cl. 435-125.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Ohngemach, Jorg; and Zeh, Heiko, 4,965,294, Cl. 522-79.000.
Wieland, Gerhard; Steckenreuter, Klaus; Gernand, Wolfgang; and Simgen, Helmut, 4,964,521, Cl. 215-32.000.

Mercurio, Dominic: *See*—
Thompson, Herbert E.; Rolph, Donald L.; Mercurio, Dominic; and Guerini, Albert J., 4,965,685, Cl. 360-97.010.

Merger, Franz; Harder, Wolfgang; Hettinger, Peter; Priester, Claus-Ulrich; Franz, Dieter; and Voges, Dieter. Joint preparation of 3-dialkylaminopropionitriles, bis-(2-cyanoethyl) ether and, if desired, ethylene-cyanohydrin. 4,965,362, Cl. 546-246.000.

Merkel, Miles A. Antenna shroud tempest armor. 4,965,606, Cl. 343-703.000.

Merrell Dow Pharmaceuticals Inc.: *See*—
Palfreyman, Michael G.; Bey, Philippe; and McDonald, Ian A., 4,965,288, Cl. 514-649.000.
Merritt, Carleton: *See*—
Chawan, Dhyaneshwar B.; Merritt, Carleton; and Matuszak, Edward A., 4,965,082, Cl. 426-331.000.
Meschi, Luciano, to Wully S.A. Packing case, particularly for sheet material. 4,964,511, Cl. 206-449.000.
Messer, Russell K.: *See*—
Saccocio, Edward J.; Varde, Uday; Hutchings, David A.; and Messer, Russell K., 4,965,165, Cl. 430-138.000.
Messerschmitt-Bolkow-Blohm GmbH: *See*—
Kranz, Walter, 4,964,592, Cl. 244-322.000.
Kranz, Walter, 4,964,593, Cl. 244-3.240.
Messina, James J. Deer repellent formulation. 4,965,070, Cl. 424-581.000.
Mestnik, Joseph G.: *See*—
Manno, Eugene; and Mestnik, Joseph G., 4,965,639, Cl. 355-260.000.
Metz, Suzanne: *See*—
Brannigan, Lawrence H.; Brinker, Ronald J.; Kaufman, Robert J.; and Metz, Suzanne, 4,964,893, Cl. 71-88.000.
Meyer, Dieter: *See*—
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Meyer, Frank: *See*—
Muller, Hanns P.; Kapps, Manfred; Vehlewald, Peter; Meyer, Frank; Cornely, Wolfgang; and Mehesch, Hans E., 4,965,292, Cl. 521-110.000.
Meyer, Harry M., III: *See*—
Weaver, John H.; Grasselli, Robert K.; Nelson, David L.; Meyer, Harry M., III; and Hill, Donald M., 4,965,244, Cl. 505-1.000.
Meyer, Jean-Luc, to Aluminum Pechiney. Method of making thixotropic metal products by continuous casting. 4,964,455, Cl. 164-468.000.
Meyer, Jean-Philippe: *See*—
Leiber, Hans-Jurgen; Meyer, Jean-Philippe; and Kummer, Christian F., 4,964,321, Cl. 82-12.000.
Meyer, John E. Loudspeaker enclosure. 4,964,482, Cl. 181-146.000.
Meyer, Karen L.: *See*—
Counsell, Raymond E.; Meyer, Karen L.; and Schwendner, Susan W., 4,965,391, Cl. 558-169.000.
Meyer, Urs, to Rieter Machine Works Limited. Method of, and apparatus for, transmitting data in a manufacturing machine comprising a plurality of production stations. 4,965,567, Cl. 340-825.160.
MHA Zentgraf Merziger Hochdruck-Armaturen GmbH & Co.: *See*—
Hein, Alfred, 4,964,436, Cl. 137-625.470.
Michaels, Jennifer E.: *See*—
Nottingham, Lawrence D.; Michaels, Thomas E.; and Michaels, Jennifer E., 4,964,295, Cl. 73-1.0DV.
Michaels, Thomas E.: *See*—
Nottingham, Lawrence D.; Michaels, Thomas E.; and Michaels, Jennifer E., 4,964,295, Cl. 73-1.0DV.
Michalik, Leo K.; and Mussio, Segio G., to Cominco Ltd. Sprinkler system and sprinkler assembly therefor. 4,964,471, Cl. 169-57.000.
Mickey, Joseph J., III, to Solitron Devices, Inc. Microwave attenuator. 4,965,538, Cl. 333-81.00A.
Micro-Controle: *See*—
Guillet, Hubert; and Vialle, Dominique, 4,965,807, Cl. 372-92.000.
Micro Strain Company: *See*—
Arms, Steven W., 4,964,862, Cl. 606-102.000.
Microcomputer Doctors, Inc.: *See*—
Green, George D.; and Mullauer, William C., 4,965,799, Cl. 371-21.200.
Micron Technology, Inc.: *See*—
Dennison, Charles H.; and Gonzalez, Fernando, 4,965,221, Cl. 437-70.000.
Mid-West Conveyor Company, Inc.: *See*—
Robinson, Victor G., 4,964,344, Cl. 104-172.500.
Middleby Marshall Inc.: *See*—
Bruno, Adrian A.; Dtwisch, Thomas; Chrzastek, Ralph; and Casanzio, Richard, 4,964,392, Cl. 126-21.00A.
Midogohchi, Susumu: *See*—
Nakai, Noboru; Isozaki, Osamu; and Midogohchi, Susumu, 4,965,312, Cl. 524-506.000.
Midwest Research Institute: *See*—
Chum, Helena L.; and Filardo, Giuseppe, 4,964,995, Cl. 210-634.000.
Miele, Joseph R., to BackStop, Inc. Back-up safety device and method. 4,964,485, Cl. 180-275.000.
Miesch, Donald H.: *See*—
Miesch, Gary D.; Miesch, Gregg D.; and Miesch, Donald H., 4,964,641, Cl. 273-175.000.
Miesch, Gary D.; Miesch, Gregg D.; and Miesch, Donald H., to Diversified Metal Incorporated. Golf club with electrical discharge machined face. 4,964,641, Cl. 273-175.000.
Miesch, Gregg D.: *See*—
Miesch, Gary D.; Miesch, Gregg D.; and Miesch, Donald H., 4,964,641, Cl. 273-175.000.
Miguchi, Akio: *See*—
Tamba, Shinichi; and Miguchi, Akio, 4,964,378, Cl. 123-41.570.
Mihara, Masaaki: *See*—
Kinoshita, Mitsuya; Mihara, Masaaki; Kobayashi, Toshifumi; and Hamamoto, Takeshi, 4,965,767, Cl. 365-49.000.
Mihara, Yuji, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion containing infrared sensitizing dyes and supersensitizing compounds. 4,965,182, Cl. 430-576.000.
Mikami, Koichi; Terada, Masahiro; Nakai, Takeshi; Sayo, Noboru; and Kumobayashi, Hidenori, to Takasago International Corporation. Process for producing optically active alpha-hydroxycarboxylates. 4,965,398, Cl. 560-60.000.
Miki, Keiko: *See*—
Yamagishi, Hideo; Nevin, William A.; Nishio, Hitoshi; Miki, Keiko; Tsuge, Kazunori; and Tawada, Yoshihisa, 4,965,225, Cl. 437-173.000.
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Milewski, Charles M. Flush mounted collapsible cleat. 4,964,355, Cl. 114-218.000.
Millar, Russell. Interior bus configuration. 4,964,671, Cl. 296-178.000.
Miller, Geoffrey Q., to UOP. Multiple zone adsorption process. 4,964,888, Cl. 55-58.000.
Miller, Greg R., to Plastics One, Inc. Electrical connector and method of making the same. 4,964,816, Cl. 439-669.000.
Miller, Harry B., to United States of America, Navy. Multi-stage noise-reducing system. 4,965,834, Cl. 381-94.000.
Miller-Johannisberg Druckmaschinen GmbH: *See*—
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Miller, Leonard G. D., to Xmas-Mil Display Products Pty. Ltd. Method and apparatus for manufacturing decorative garland. 4,964,932, Cl. 156-174.000.
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Min, Taeik; and Touhsaent, Robert E., to Mobil Oil Corporation. Latex coating composition of multilayered copolymer particles of vinylidene chloride and acrylic comonomers. 4,965,130, Cl. 428-407.000.
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Misaki, Akira; Sone, Yoshiaki; Mitsuhashi, Masakazu; and Miyake, Toshio, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Ken-

kyujo. Beta-D-glucan, and its production and uses. 4,965,347, Cl. 536-1.100.
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Anderson, John; Homeyer, Bernhard; and Zeck, Walter M., 4,965,256, Cl. 514-128.000.
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Mohr, Paul H.; and Pepe, Enrico J., to First Brands Corporation. Copolymers of polysilyl compounds and anti-gelling agents. 4,965,334, Cl. 528-34.000.

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Fields, Donald L., Jr.; Miller, William H.; and Pulwer, Mitchell J., 4,965,403, Cl. 562-17.000.
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Morghen, Manfred, to General Dynamics Corporation, Convair Division. Optical or laser ball target assemblies for precision location measurements. 4,964,218, Cl. 33-293.000.
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Morikiyo, Akira; Morimoto, Ryuji; and Yamahata, Misao, to Tsubakimoto Chain Co. Sorting conveyor system. 4,964,499, Cl. 198-365.000.
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Morrelli, Vincent A. Windsurfer sail. 4,964,353, Cl. 114-39.200.
Morris, Chris, to Electrosource, Inc. Lead-acid rechargeable storage battery. 4,964,878, Cl. 29-623.100.
Morris, Mary Lou; and Wood, Thomas E., to Minnesota Mining and Manufacturing Company. Ceramic alumina abrasive grains seeded with iron oxide. 4,964,883, Cl. 51-293.000.
Morris, Scott S.; Shramek, James F.; and Owsley, David P., to Bull HN Information Systems Inc. Page printer with machine-readable-character-based controls. 4,965,613, Cl. 346-25.000.
Morrow, Lester; and Kidd, R. Christopher, to Marlboro Marketing, Inc. Measured quantity dispenser. 4,964,546, Cl. 222-352.000.
Morse, Paul G.; and Petty, Charles C., to Honeywell Inc. Internal calibration source for infrared radiation detector. 4,965,448, Cl. 250-252.100.
Morton, Roger R. A.; and Olesik, Joseph T., to Eastman Kodak Company. Method for electronically duplicating film images while maintaining a high degree of image quality. 4,965,679, Cl. 358-462.000.
Mosebach Manufacturing Company: *See*—
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Moser, Theodor; and Krieger, Eberhard, to Robert Bosch GmbH. Machine for filling and closing two-piece capsules. 4,964,262, Cl. 53-506.000.
Moskovsky Gorodskoi Nauchno-Issledovatelsky Institut Skoroi Pomoschi Imeni N.V. Sklifosovskogo: *See*—
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Mosser, Vincent; and Robert, Jean-Louis, to Schlumberger Industries. Solid state pressure sensors. 4,965,697, Cl. 361-283.000.
Mostafa, Asghar D.; and Berry, Kirk H., to Data General Corporation. Apparatus for flexibly allocating bandwidth for a point-to-point, serial, bidirectional communication path. 4,965,798, Cl. 370-079.000.
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Craft, Scott; Pfizenmayer, Henry L.; and Wernett, Frederick C., 4,965,526, Cl. 330-66.000.
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Kommrusch, Richard S., 4,965,537, Cl. 333-202.000.
McCaleb, Frank D.; and Pagones, Basil, 4,965,505, Cl. 320-13.000.
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Pigott, John M., 4,965,466, Cl. 307-296.200.
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Mouri, Akihiro: *See*—
Kurabayashi, Yutaka; Ohnishi, Toshikazu; Yoshinaga, Kazuo; Mouri, Akihiro; Isaka, Kazuo; Kaneko, Shuzo; Eguchi, Takeo; and Toshida, Yomishi, 4,965,591, Cl. 346-108.000.
Moxon, Neville T.; Torrance, Alstair C.; and Richardson, Stephen B., to Broken Hill Proprietary Co., Ltd. Sound attenuation with foam. 4,964,329, Cl. 86-50.000.
Mozley, Richard H., to National Research Development Corporation. Minerals separator. 4,964,845, Cl. 494-52.000.
Mueller, Bruce M., to Seaquist Closures. Multiple chamber dispensing container and closure system. 4,964,539, Cl. 222-94.000.
Mueller Co.: *See*—
Logman, Timothy M., 4,964,613, Cl. 251-267.000.
Sands, Robert E.; and Flores, Carl E., 4,964,614, Cl. 251-315.000.
Mueller, Heinz; Herold, Claus-Peter; and von Tapavicza, Stephan, to Henkel Kommanditgesellschaft auf Aktien. Compositions for freeing jammed drill pipes. 4,964,615, Cl. 252-8.551.
Mueller, Max A., to Baker Hughes, Incorporated. Horizontal belt filter guide. 4,964,988, Cl. 210-401.000.
Mueller, Peter. Variable pitch propeller for watercraft. 4,964,822, Cl. 440-50.000.
Mueller, Walter B., to W. R. Grace & Co.-Conn. Extruded vinylidene chloride copolymer flexible packaging film. 4,965,136, Cl. 428-414.000.
Mueller, William J., to United States of America, Navy. Planar end-fire array. 4,965,776, Cl. 367-126.000.
Muffoletto, Barry C.: *See*—
Keister, Pamela P.; Mead, Ralph T.; Muffoletto, Barry C.; Takeuchi, Esther S.; Ebel, Steven J.; Zelinsky, Michael A.; and Greenwood, John M., 4,964,877, Cl. 29-623.100.
Muhr und Bender, Maschinenbau GmbH: *See*—
Steinhoff, Karl, 4,964,326, Cl. 838-559.000.
Mukunoki, Yasuo: *See*—
Suematsu, Koichi; Yamada, Sumito; Yasuda, Tomokazu; Yamanouchi, Junichi; and Mukunoki, Yasuo, 4,965,180, Cl. 430-518.000.
Mullauer, William C.: *See*—
Green, George D.; and Mullauer, William C., 4,965,799, Cl. 371-21.200.
Muller, Gerold: *See*—
Reuter, Knud; Freitag, Dieter; Weymans, Gunther; Dhein, Rolf; Meier, Erich; and Muller, Gerold, 4,964,890, Cl. 55-158.000.
Muller, Hanns P.; Kapps, Manfred; Vehlewald, Peter; Meyer, Frank; Cornely, Wolfgang; and Mehesch, Hans E., to Bayer Aktiengesellschaft; and Bergwerksverband GmbH. Process for strengthening geological formations. 4,965,292, Cl. 521-110.000.
Muller, Jurgen: *See*—
Schneider, Rudolf; Muller, Jurgen; and Voigtlander, Volkmar, 4,965,455, Cl. 250-484.100.
Mullis, Jeffrey C.: *See*—
Vandenberg, Edwin J.; and Mullis, Jeffrey C., 4,965,342, Cl. 528-417.000.
Mullis, Kary B.; Erlich, Henry A.; Gelfand, David H.; Horn, Glenn; and Saiki, Randall K., to Cetus Corporation. Process for amplifying,

detecting, and/or cloning nucleic acid sequences using a thermostable enzyme. 4,965,188, Cl. 435-6.000.

Mummery, Herbert L.: *See—*
Dombrowski, James H.; Mummery, Herbert L.; Buecher, Roger W.; and Yumori, Isao R., 4,964,491, Cl. 188-299.000.

Munro, Bradley L.: *See—*
Goetz, Kenneth D.; and Munro, Bradley L., 4,965,370, Cl. 548-555.000.

Munshi, Jal F.: *See—*
Mee, John D.; and Munshi, Jal F., 4,965,183, Cl. 430-578.000.

Muraguchi, Yukito: *See—*
Nakajima, Hirohito; Ito, Takaaki; and Muraguchi, Yukito, 4,965,230, Cl. 501-128.000.

Murai, Teruyuki; Hashimoto, Yoshihiro; and Kawakita, Takao, to Sumitomo Electric Industries, Ltd. Method for producing a wire incrusted with abrasive grain. 4,964,209, Cl. 29-527.600.

Murakami, Koichi: *See—*
Hiroi, Masakazu; Naito, Masataka; and Murakami, Koichi, 4,965,629, Cl. 355-50.000.

Murakami, Toshifumi: *See—*
Katayama, Hideaki; Murakami, Toshifumi; Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; and Ijiri, Masaaki, 4,964,792, Cl. 425-32.000.

Murakami, Tsugio: *See—*
Saitoh, Hiroyuki; and Murakami, Tsugio, 4,965,016, Cl. 252-186.370.

Murano, Katsuaki; Hirano, Sadayuki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, to Suzuki Jidosha Kogyo Kabushiki Kaisha; and Mitsubishi Denki Kabushiki Kaisha. Hydraulic control method for continuously variable speed change gear mechanism for a vehicle and a drive control method for a pressure valve thereof. 4,964,317, Cl. 74-844.000.

Murata Manufacturing Co., Ltd.: *See—*
Sakamoto, Yukio; Tanabe, Takeshi; Fukutani, Iwao; and Hori, Toshio, 4,964,806, Cl. 439-79.000.

Murata, Yoshitaka; and Kawakami, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Floor nozzle of a vacuum cleaner. 4,964,190, Cl. 15-369.000.

Murayama, Eigoro: *See—*
Funakoshi, Susumu; and Murayama, Eigoro, 4,965,405, Cl. 562-441.000.

Murayama, Fumio; and Homma, Yoshiaki, to Pioneer Electronic Corporation. Environmentally resistant loudspeaker. 4,965,837, Cl. 381-186.000.

Murgue, Jean Pierre; Pressiai, Robert; and Robin, Leon, to Thomson-CSF. Process and device for detecting the coming interposition of a mask between an aircraft and a target, particularly in a laser-guided weapon firing system. 4,964,723, Cl. 356-141.000.

Murofushi, Harutoshi, to Tokyo Electric Co., Ltd. Ticket issuing apparatus. 4,965,438, Cl. 235-384.000.

Murphy, Timothy I., to Unisys Corporation. Electroplating apparatus. 4,964,964, Cl. 204-224.00R.

Murray, John R., Jr.: *See—*
Flowers, Richard W.; and Murray, John R., Jr., 4,964,348, Cl. 105-406.200.

Murray, Thomas L., Jr.: *See—*
Holtey, Thomas O.; Murray, Thomas L., Jr.; Perzan, Wayne A.; and Smith, Scott W., 4,965,721, Cl. 364-200.000.

Murray, Thorntone E. Telephone line security system. 4,965,459, Cl. 379-189.000.

Musuio, Segio G.: *See—*
Michalik, Leo K.; and Musuio, Segio G., 4,964,471, Cl. 169-57.000.

Mustain, Richard G.: *See—*
Mitchell, Glen R.; Mustain, Richard G.; Peterson, Jon H.; and Whitley, Lawrence D., 4,965,720, Cl. 364-200.000.

Mustonen, Olavi: *See—*
Engstrom, Ulf; and Mustonen, Olavi, 4,964,909, Cl. 75-246.000.

Musumeci, Salvatore: *See—*
Zambrano, Raffaele; and Musumeci, Salvatore, 4,965,215, Cl. 437-31.000.

Muth, Gunter; Wohlleben, Wolfgang; Puhler, Alfred; Wohner, Gerhard; and Marquardt, Rudiger, to Hoechst Aktiengesellschaft. Color marker for clonings in *Streptomyces lividans*. 4,965,207, Cl. 435-320.000.

Muto, James A.; and Patel, Ramesh P., to Kidde Industries, Inc. Forklift truck having a telescopic auxiliary boom articulated to a telescopic main boom. 4,964,778, Cl. 414-700.000.

Muto, Ryujiro: *See—*
Sugimoto, Yoshio; Muto, Ryujiro; and Arakaki, Takeji, 4,964,702, Cl. 350-339.00R.

Muto, Tadanobu: *See—*
Komiya, Fujiro; and Muto, Tadanobu, 4,964,977, Cl. 261-130.000.

Mutoh, Nobuyoshi: *See—*
Ueda, Shigeta; Honda, Kazuo; Ikimi, Takashi; Matsuda, Toshihiko; Nagase, Hiroshi; and Mutoh, Nobuyoshi, 4,965,504, Cl. 318-802.000.

Mutschall, Hugo: *See—*
Focke, Heinz; and Mutschall, Hugo, 4,964,260, Cl. 53-467.000.

Myers, Larry G., to Mobil Oil Corporation. Anti-sand bridge tool and method for dislodging sand bridges. 4,964,464, Cl. 166-278.000.

Myller, Rolf. Triangle based interconnecting block set. 4,964,834, Cl. 446-118.000.

Myohga, Osamu: *See—*
Ohnishi, Osamu; Takahashi, Sadayuki; Myohga, Osamu; Uchikawa, Tadao; Inoue, Takeshi; Kagaya, Isao; and Ueha, Sadayuki, 4,965,482, Cl. 310-323.000.

Nabial, Wanda: *See—*
Schiltz, John R.; and Nabial, Wanda, 4,965,450, Cl. 250-303.000.

Nagai, Junshiro, to Tokyo Electric Co., Ltd. Ticket issuing apparatus. 4,965,437, Cl. 235-381.000.

Nagai, Yoshitaka: *See—*
Yamasaki, Masahiko; and Nagai, Yoshitaka, 4,965,198, Cl. 435-70.210.

Nagasawa, Kenichi; and Hori, Taizou, to Canon Kabushiki Kaisha. Recording and reproducing system with selective matrix conversion. 4,965,674, Cl. 358-341.000.

Nagase, Hiroshi: *See—*
Ueda, Shigeta; Honda, Kazuo; Ikimi, Takashi; Matsuda, Toshihiko; Nagase, Hiroshi; and Mutoh, Nobuyoshi, 4,965,504, Cl. 318-802.000.

Nagashima, Shinichi: *See—*
Kobayashi, Kouji; Minami, Hideyuki; and Nagashima, Shinichi, 4,965,478, Cl. 310-249.000.

Nagata, Toru: *See—*
Shikaumi, Masao; Nagata, Toru; Washisu, Koichi; and Sumio, Hiroshi, 4,965,619, Cl. 354-410.000.

Nagatsuka, Ikutaroh; Matsumura, Yasuo; Takeda, Masayuki; Suzuki, Chiaki; and Aoki, Takayoshi, to Fuji Xerox Co., Ltd. Electrophotographic developer carrier particles coated with binder resin. 4,965,160, Cl. 430-108.000.

Nagoshi, Shigeyasu; Terasawa, Koji; and Yamaguchi, Hideki, to Canon Kabushiki Kaisha. Ink jet recording apparatus with waste ink distribution paths to plural cartridges. 4,965,596, Cl. 346-140.00R.

Nagumo, Akihiko: *See—*
Ogiwara, Nagao; and Nagumo, Akihiko, 4,965,623, Cl. 355-27.000.

Nagy, Imre: *See—*
Foldi, Tivadar; Biro, Gabor; Barna, Tamas; Nagy, Imre; and Vincze, Laszlo , 4,965,876, Cl. 362-247.000.

Nair, Mridula; Pierce, Zona R.; and DiPrima, Donna A., to Eastman Kodak Company. Colloidally stabilized suspension process. 4,965,131, Cl. 428-407.000.

Nair, Vijay G.; Conrow, Ramson B.; Wang, Bosco S.; and Ruszala-Mallon, V. M., to American Cyanamid Company. Substituted dibenzothiophenes. 4,965,284, Cl. 514-443.000.

Naito, Masataka: *See—*
Hiroi, Masakazu; Naito, Masataka; and Murakami, Koichi, 4,965,629, Cl. 355-50.000.

Naito, Takao; Chikama, Terumi; Watanabe, Shigeki; Kiyonaga, Tetsuya; Onoda, Yoshihito; Kuwahara, Hideo; Onaka, Hiroshi; and Miyata, Hideyuki, to Fujitsu Limited. Polarization diversity optical receiver for coherent optical communication. 4,965,858, Cl. 455-619.000.

Nakabayashi, Takeo: *See—*
Kondoh, Harufusa; and Nakabayashi, Takeo, 4,965,469, Cl. 307-446.000.

Nakade, Yasuhiko: *See—*
Shinno, Yoshio; and Nakade, Yasuhiko, 4,964,383, Cl. 123-195.00C.

Nakae, Kazumi: *See—*
Akasaka, Takeshi; Ochi, Kumie; Onari, Kazuhiro; Katayama, Tsutomu; Furuta, Hitoshi; Nakae, Kazumi; and Fukuda, Satomi, 4,965,080, Cl. 426-104.000.

Nakagawa, Atsushi: *See—*
Inada, Masanori; Eda, Kazuo; Ota, Yorito; Nakagawa, Atsushi; and Yanagihara, Manabu, 4,965,650, Cl. 357-34.000.

Nakagawa, Fujio; and Kanemasa, Akira, to NEC Corporation. Echo canceller. 4,965,823, Cl. 379-411.000.

Nakagawa, Katsumi: *See—*
Hatanaka, Katsunori; Uzawa, Shunichi; Nakagawa, Katsumi; and Komatsu, Toshiyuki, 4,965,570, Cl. 340-825.790.

Nakagawa, Mikio: *See—*
Sugimoto, Masaru; Kohno, Osamu; Ikeno, Yoshimitsu; Sadakata, Nobuyuki; Nakagawa, Mikio; Aoki, Shin'ya; Tan, Masayuki; Okiai, Ryuichi; Yoshida, Syotaro; Hasegawa, Masakazu; and Yamanouchi, Hiroshi, 4,965,245, Cl. 505-1.000.

Nakai, Noboru; Isozaki, Osamu; and Midogohchi, Susumu, to Kansai Paint Company, Limited. Nonaqueous vehicle composition for coating materials. 4,965,312, Cl. 524-506.000.

Nakai, Takeshi: *See—*
Mikami, Koichi; Terada, Masahiro; Nakai, Takeshi; Sayo, Noboru; and Kumobayashi, Hidenori, 4,965,398, Cl. 560-60.000.

Nakajima, Hirohito; Ito, Takaaki; and Muraguchi, Yukito, to Inax Corporation. Alumina porous body and production of the same. 4,965,230, Cl. 501-128.000.

Nakajima, Kunio: *See—*
Tasaki, Hirohisa; and Nakajima, Kunio, 4,965,580, Cl. 341-200.000.

Nakamoto, Atsuhiro: *See—*
Nobutani, Tohru; Nakamoto, Atsuhiro; Izumi, Hideo; and Miyano, Takahiro, 4,964,962, Cl. 204-192.300.

Nakamura, Hideo: *See—*
Uno, Hitoshi; Kon, Tatsuya; Nishikawa, Yoshinori; Shindo, Tokuhiko; Nakamura, Hideo; and Ishii, Katsumi, 4,965,266, Cl. 514-253.000.

Nakamura, Hisashi: *See—*
Otsuka, Kanji; Kuroda, Shigeo; Sato, Katsuyuki; Nakamura, Hisashi; and Shouji, Shinichi, 4,965,653, Cl. 357-55.000.

Nakamura, Koji: *See—*
Kagawa, Akinobu; Inoue, Teruichi; Kametani, Masaru; and Nakamura, Koji, 4,964,742, Cl. 384-515.000.

Nakamura, Koki: *See—*
Ukai, Toshinao; Shirasu, Kazuhiro; Nakamura, Koki; Koya, Keizo; Okada, Masahiro; and Katoh, Kazunobu, 4,965,170, Cl. 430-264.000.

Nakamura, Takashi: *See*—
Hirahara, Takuji; Nakamura, Takashi; Kumeno, Yoshiko; Ohta, Takayuki; and Kasai, Tetsuo, 4,965,302, Cl. 524-83.000.
Nakamura, Tetsuo: *See*—
Shukunobe, Yukitaka; Nakamura, Tetsuo; Yoshida, Tomoe; Doki, Ryoichi; Kuwazuru, Mamoru; and Shimoda, Kouzou, 4,965,051, Cl. 422-145.000.
Nakane, Takemi: *See*—
Yoshida, Hiroshi; Noguchi, Takeki; Ichikawa, Masahiko; Nakane, Takemi; Kubo, Kyoji; and Kinoshita, Kenichiro, 4,964,734, Cl. 374-14.000.
Nakanishi, Kazuhiro: *See*—
Fujita, Masami; Nakanishi, Kazuhiro; and Sameshima, Yoshinobu, 4,965,615, Cl. 354-145.100.
Nakanishi, Kiyoshi: *See*—
Sawada, Hiroshi; Ueda, Tatehito; Nakanishi, Kiyoshi; and Demura, Takayuki, 4,964,271, Cl. 60-274.000.
Nakanishi, Tatsuo; Tadokoro, Toyohiko; and Fujimura, Masaki, to Yamaha Corporation. Iron club head for golf. 4,964,640, Cl. 273-167.00H.
Nakano, Masaaki; Inoue, Tomoaki; Kawaike, Kazuhiko; Yamamoto, Yuji; and Ishikawa, Motoyuki, to Hitachi, Ltd. Bearing apparatus for a rotary machine having a horizontal rotating shaft. 4,964,740, Cl. 384-313.000.
Nakano, Takuo: *See*—
Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; and Nakano, Takuo, 4,965,263, Cl. 514-247.000.
Nakano, Yasuhiko: *See*—
Shizaki, Tomoo; Kawaguchi, Yoshiyuki; Nakano, Yasuhiko; Gotoda, Yusuke; and Takemura, Hiroo, 4,964,381, Cl. 123-73.00A.
Nakao, Toru; Morita, Kenji; Hisadome, Masao; and Takehara, Shuzo, to Yoshitomi Pharmaceutical Industries, Ltd. Thienocinnoline compounds and their pharmaceutical use. 4,965,264, Cl. 514-248.000.
Nakatsugawa, Hiroshi, to Furukawa Circuit Foil Co., Ltd. Insoluble electrode device for treatment of metallic material. 4,964,965, Cl. 204-280.000.
Nakatsugawa, Tomomi: *See*—
Sakaki, Mamoru; Nakatsugawa, Tomomi; Koike, Shoji; and Sato, Hiroshi, 4,965,612, Cl. 346-1.100.
Nakazawa, Takeshi: *See*—
Takayama, Mitsunao; Nakazawa, Takeshi; Yamauchi, Kozo; and Asano, Atsushi, 4,964,841, Cl. 474-11.000.
Nalco Chemical Company: *See*—
Adams, William L.; and Chesnut, Gary R., 4,964,468, Cl. 166-310.000.
Payne, Charles C., 4,964,919, Cl. 134-2.000.
Namen, Anthony E.; Goodwin, Raymond G.; Lupton, Stephen D.; and Mochizuki, Diane Y., to Immunex Corp. Interleukin-7. 4,965,195, Cl. 435-69.520.
Namikawa, Toshiyuki: *See*—
Kato, Kinya; Ushida, Kazuo; Namikawa, Toshiyuki; Matsumoto, Koichi; Suwa, Kyoichi; and Ohno, Koichi, 4,965,630, Cl. 355-52.000.
Narayan, Badhri: *See*—
Roddy, James E.; Narayan, Badhri; and Granger, Edward M., 4,965,599, Cl. 346-160.000.
Narhi, Larry: *See*—
Kirk, John; and Narhi, Larry, 4,965,723, Cl. 364-200.000.
Narita, Hiroaki: *See*—
Ebe, Kazuyoshi; Narita, Hiroaki; Taguchi, Katsuhisa; Akeda, Yoshitaka; and Saito, Takanori, 4,965,127, Cl. 428-343.000.
Nash, John V., to Kinetrol Limited of Trading Estate. Subplate-mounted control valves in convertible oscillator drive system. 4,964,273, Cl. 60-325.000.
Nashua Corporation: *See*—
Mahmud, Nargis A., 4,965,161, Cl. 430-109.000.
National Research Development Corporation: *See*—
Mozley, Richard H., 4,964,845, Cl. 494-52.000.
National Semiconductor Corporation: *See*—
Neuman, Darren D., 4,965,535, Cl. 331-116.0FE.
Patchen, Paul J., 4,965,524, Cl. 328-72.000.
National Starch and Chemical Investment Holding Corporation: *See*—
Solarek, Daniel B.; Dirscherl, Teresa A.; Hernandez, Henry R.; and Jarowenko, Wadym, 4,964,953, Cl. 162-175.000.
NCR Corporation: *See*—
Beam, Don E.; Wills, David C.; and Forsythe, Donald L., 4,964,606, Cl. 248-333.000.
DuLac, Keith B., 4,965,801, Cl. 371-40.100.
Malotke, Timothy P.; Kappel, Glendon D.; and Marohl, Charles H., 4,964,810, Cl. 439-368.000.
Winchell, Michael A.; and Steele, Robin L., 4,965,741, Cl. 364-513.000.
Neal, Donald F.; Kearns, Michael W.; Fox, Stephen P.; Melville, James E.; Wright, Kenneth W.; Wood, Philip S.; Pinder, John T.; and Clark, Stephen C. Rotating or moving metal components and methods of manufacturing such components. 4,964,564, Cl. 228-107.000.
NEC Corporation: *See*—
Aono, Fumio, 4,965,764, Cl. 364-900.000.
Denda, Akira, 4,965,465, Cl. 307-273.000.
Endo, Kazuhito, 4,965,809, Cl. 375-38.000.
Fukushima, Tetsuyuki; and Kobayashi, Satoru, 4,965,766, Cl. 364-900.000.
Nakagawa, Fujio; and Kanemasa, Akira, 4,965,823, Cl. 379-411.000.
Noguchi, Kesao, 4,965,565, Cl. 340-784.000.
Ohnishi, Osamu; Takahashi, Sadayuki; Myohga, Osamu; Uchikawa, Tadao; Inoue, Takeshi; Kagaya, Isao; and Ueha, Sadayuki, 4,965,482, Cl. 310-323.000.
Takahashi, Mitsuasa, 4,965,647, Cl. 357-23.400.
Tejima, Shunichiro, 4,965,851, Cl. 455-52.000.
Tokuume, Takahiro, 4,965,722, Cl. 364-200.000.
Watanabe, Masayoshi; and Noda, Seiichi, 4,965,576, Cl. 341-94.000.
Yoshida, Norio; and Shimizu, Hiroshi, 4,965,814, Cl. 375-111.000.
Yoshida, Yasuharu, 4,965,536, Cl. 332-103.000.
Nederlandse Organisatie Voor Toegepast-Natuurwetenschappe Lijk: *See*—
Greidanus, Pieter J.; Feijen, Jan; Eenink, Marinus J. D.; Rieke, Johannes C.; Olijslager, Jan; and Albers, Jan H. M., 4,965,128, Cl. 428-398.000.
Negrussi, Luigi, to Sted Engineering S.R.L. Slitting and rewiding machine. 4,964,585, Cl. 242-56.00R.
Nehring, Jurgen: *See*—
Holmes, Paul; Nevin, Alan; Amstutz, Hermann; and Nehring, Jurgen, 4,965,017, Cl. 252-299.400.
Neiger, Jack W.: *See*—
Kennedy, Charles G.; McKeown, Patrick D.; and Neiger, Jack W., 4,964,618, Cl. 256-24.000.
Nelsen, Barry F.; and Shyu, Jieh-Hwa, to Olin Hunt Specialty Products Inc. Process for preparing a nonconductive substrate for electroplating. 4,964,959, Cl. 204-15.000.
Nelson, David L.: *See*—
Weaver, John H.; Grasselli, Robert K.; Nelson, David L.; Meyer, Harry M., III; and Hill, Donald M., 4,965,244, Cl. 505-1.000.
Nelson, John C.; and Cornelison, Kenneth E., to Alcatel NA, Inc. Optical fiber cable having optical fibers with various lengths. 4,964,691, Cl. 350-96.230.
Nelson, Thomas E., to Soltech, Inc. Modular acoustical panel and method of making same. 4,964,250, Cl. 52-144.000.
Nelson, Victor. Magnetic switch for coaxial transmission lines. 4,965,542, Cl. 335-5.000.
Nentwig, Gunther: *See*—
Kruger, Bernd W.; Sasse, Klaus; Lunkenheimer, Winfried; Hoever, Franz P.; Nentwig, Gunther; and Behrenz, Wolfgang, 4,965,286, Cl. 514-514.000.
NeoRx Corporation: *See*—
Fritzberg, Alan R.; Kasina, Sudhakar; Rao, Tripuraneni N.; VanderHeyden, Jean-Luc; and Srinivasan, Ananthachari, 4,965,392, Cl. 558-254.000.
Neron, Jacques: *See*—
Lenormand, Regis; Clerino, Antoine; Neron, Jacques; Marre, Jean-Philippe; and Raguenet, Gerard, 4,965,588, Cl. 342-372.000.
Nesbitt, Russell U., Jr.: *See*—
Silbering, Steven B.; Blythe, Rowland P., Jr.; Nesbitt, Russell U., Jr.; and Fawzi, Mahdi B., 4,965,203, Cl. 435-188.000.
Nestec S.A.: *See*—
Heyland, Sven; Rolli, Karl; Roschli, David; and Silver, Jaak J., 4,965,085, Cl. 426-533.000.
Hose, Hugh; Sozzi, Tomaso; and Wood, Robert D., 4,965,079, Cl. 426-43.000.
Network Equipment Technologies, Inc.: *See*—
Newman, Peter, 4,965,788, Cl. 370-60.000.
Neuhauser, Hubert: *See*—
Stendel, Wilhelm; Neuhauser, Hubert; and Koeniger, Nikolaus, 4,965,287, Cl. 514-531.000.
Neuman, Darren D., to National Semiconductor Corporation. Multiple speed oscillator. 4,965,535, Cl. 331-116.0FE.
Neuman, George A.; and Bloss, Karl H., to PPG Industries, Inc. Chemical vapor deposition of bismuth oxide. 4,965,093, Cl. 427-109.000.
Neumann, Hans-Werner: *See*—
Baur, Richard; Stoeckigt, Dieter; Neumann, Hans-Werner; Goertz, Hans-Helmut; and Wagner, Norbert, 4,965,009, Cl. 252-142.000.
Neuwirth, Thomas A.: *See*—
Rommelfaenger, Peter R.; and Neuwirth, Thomas A., 4,964,193, Cl. 16-225.000.
Nevin, Alan: *See*—
Holmes, Paul; Nevin, Alan; Amstutz, Hermann; and Nehring, Jurgen, 4,965,017, Cl. 252-299.400.
Nevin, William A.: *See*—
Yamagishi, Hideo; Nevin, William A.; Nishio, Hitoshi; Miki, Keiko; Tsuge, Kazunori; and Tawada, Yoshihisa, 4,965,225, Cl. 437-173.000.
Newlove, John C.: *See*—
Williams, Dennis A.; Newlove, John C.; and Horton, Roger L., 4,964,466, Cl. 166-300.000.
Newman, Neil A.; Bankstahl, Herbert A.; Griffiths, John M.; Forsgren, Lyle M.; and Beck, Wayne T., to Brunswick Corporation. Stern drive lift and trim system. 4,964,823, Cl. 440-61.000.
Newman, Peter, to Network Equipment Technologies, Inc. Self-routing switch element for an asynchronous time switch. 4,965,788, Cl. 370-60.000.
Ng, Andrew S. O.; and Ling, Peter P. T., to Sylvia Industries Ltd. Releasable pressure vents. 4,965,144, Cl. 429-55.000.
Ng, Charles H., to VLSI Technology, Inc. Machine process for routing interconnections from one module to another module and for positioning said two modules after said modules are interconnected. 4,965,739, Cl. 364-491.000.
Ng, Fred W.; DiSiena, James P.; and Baeisu, Amjad A., to Atlantic Richfield Company. Method and system for vertical seismic profiling by measuring drilling vibrations. 4,965,774, Cl. 367-75.000.
NGK Insulators, Ltd.: *See*—
Oshima, Shinji; and Misawa, Hidenobu, 4,965,107, Cl. 428-34.400.

Takeuchi, Yukihisa; and Watanabe, Tetsuo, 4,964,923, Cl. 148-276.000.
Takeuchi, Yukihisa; and Yamamoto, Azuma, 4,965,589, Cl. 346-76.0PH.

NGK Spark Plug Co., Ltd.: *See*—
Kawajiri, Shogo; Ito, Akio; and Yamamoto, Katsumi, 4,964,294, Cl. 73-35.000.

Ngo, Khai D. T., to General Electric Company. Switching converter with pseudo-resonant DC link. 4,965,709, Cl. 363-37.000.

Nicollini, Germano; and Confalonieri, Pierangelo, to SGS-Thomson Microelectronics s.r.l. High resolution, fully differential CMOS comparator. 4,965,468, Cl. 307-362.000.

Nieendick, Claus: *See*—
Jeschke, Peter; Kiewert, Eva; Nieendick, Claus; Nuesslein, Hans; and Sandkuehler, Peter, 4,965,014, Cl. 252-174.220.

Nikken Chemical Laboratory Co., Ltd.: *See*—
Yoshida, Hajime; Kamada, Tokuichi; and Kainuma, Osamu, 4,965,168, Cl. 430-204.000.

Nikko Industry Co., Ltd.: *See*—
Udo, Eiji, 4,965,813, Cl. 373-2.000.

Nikon Corporation: *See*—
Kato, Kinya; Ushida, Kazuo; Namikawa, Toshiyuki; Matsumoto, Koichi; Suwa, Kyoichi; and Ohno, Koichi, 4,965,630, Cl. 355-52.000.
Matsubara, Takashi, 4,965,617, Cl. 354-246.000.
Ogasawara, Akira, 4,965,502, Cl. 318-628.000.
Suzuki, Shimichi, 4,965,141, Cl. 429-9.000.
Takagi, Tadao; Sato, Toshihiro; and Saegusa, Takashi, 4,965,620, Cl. 354-416.000.

Niles, Roger G.: *See*—
Polzin, R. Stephen; Niles, Roger G.; and Lin, Rueysen, 4,965,793, Cl. 370-94.100.

Nimmey, Alan; and Hayes, Harry, to Colgate-Palmolive Company. Package for flowable material. 4,964,538, Cl. 222-92.000.

Nippon Gasket Co., Ltd.: *See*—
Inoue, Kunitoshi; Kawaguchi, Shigeru; and Nomoto, Kazuhiro, 4,964,293, Cl. 72-379.200.

Nippon Paint Co., Ltd.: *See*—
Kawabata, Masami; Harada, Masahiko; and Takimoto, Yasuyuki, 4,965,171, Cl. 430-288.000.

Nippon Steel Welding Products & Engineering Co., Ltd.: *See*—
Sakuno, Fumihiko; Sonoda, Hirofumi; Honda, Satoshi; and Kumagae, Ryouhei, 4,964,791, Cl. 425-8.000.

Nippon Telegraph and Telephone Corp.: *See*—
Saki, Yosinori; Kotera, Hiroshi; Unemoto, Kazuo; Arikawa, Tomohiko; Jung, Wayne; Tutt, Timothy; and Dunk, Mike, 4,965,558, Cl. 340-712.000.

Nippon Zeon Co., Ltd.: *See*—
Watanabe, Noboru; and Kubo, Yoichiro, 4,965,323, Cl. 525-349.000.

Nippondenso Co., Ltd.: *See*—
Kaneko, Yasuhiro; and Ito, Shinzo, 4,965,841, Cl. 382-1.000.

Nishi, Hiroji: *See*—
Mizuno, Toru; Hara, Ryuichi; and Nishi, Hiroji, 4,965,500, Cl. 318-568.130.

Nishiguchi, Masanori, to Sumitomo Electric Industries, Ltd. Superconducting coil and a method for producing the same. 4,965,247, Cl. 505-1.000.

Nishiguchi, Toshihiko; and Yamamura, Mika, to Mita Industrial Co., Ltd. Organic photoconductive material for electrophotography. 4,965,155, Cl. 430-58.000.

Nishihara, H. Keith: *See*—
Crossley, P. A.; and Nishihara, H. Keith, 4,965,842, Cl. 382-8.000.

Nishii, Hayato: *See*—
Funayama, Osamu; Arai, Mikiro; Nishii, Hayato; and Isoda, Takeshi, 4,965,058, Cl. 423-325.000.

Nishijima, Hirotaka; and Ugawa, Satoru, to Nissan Motor Co., Ltd.; and Ohi Seisakusho Co., Ltd. Automotive window regulator. 4,964,238, Cl. 49-352.000.

Nishikawa, Masayuki: *See*—
Fukuda, Yuzuru; and Nishikawa, Masayuki, 4,965,164, Cl. 430-128.000.
Karakida, Kenichi; Yagi, Shigeru; Fukuda, Yuzuru; Nishikawa, Masayuki; Roh, Te Nam; Takahashi, Noriyoshi; and Ono, Masato, 4,965,154, Cl. 430-58.000.

Nishikawa, Yoshinori: *See*—
Uno, Hitoshi; Kon, Tatsuya; Nishikawa, Yoshinori; Shindo, Tokuhiko; Nakamura, Hideo; and Ishii, Katsumi, 4,965,266, Cl. 514-253.000.

Nishimura, Akira; and Nozuyama, Yasuyuki, to Kabushiki Kaisha Toshiba. Test circuit for logic ICS. 4,965,511, Cl. 324-73.100.

Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; and Nakano, Takuo, to Mitsui Toatsu Kagaku Kabushiki Kaisha. 6-acylaminophenyl-5-alkyl-4,5-dihydro-3(2H)-pyridazinone compounds useful as blood pressure depressants, antithrombotic agents and in the treatment of heart disease. 4,965,263, Cl. 514-247.000.

Nishino, Atsushi; Mizuno, Yasuo; Ikeda, Masaki; and Hiraka, Masahiro, to Matsushita Electric Industrial Co., Ltd. Glass ceramic for coating metal substrate. 4,965,229, Cl. 501-14.000.

Nishino, Tetsuo; Isono, Osamu; Tachibana, Tetsuo; Iwabuchi, Eisuke; and Fukui, Toshimasa, to Fujitsu Limited. Communication system for forming different networks on the same ring transmission line. 4,965,790, Cl. 370-85.120.

Nishio, Hitoshi: *See*—
Yamagishi, Hideo; Nevin, William A.; Nishio, Hitoshi; Miki, Keiko; Tsuge, Kazunori; and Tawada, Yoshihisa, 4,965,225, Cl. 437-173.000.

Nishiumi, Kenji; Kasuya, Toru; Mori, Yoshikazu; and Itako, Eiji, to Kabushiki Kaisha Nippon Conlux. Printed paper dispensing apparatus and method of controlling said apparatus. 4,964,517, Cl. 209-534.000.

Nishiyama, Toru; and Minakami, Hiroshi, to Nissan Motor Co., Ltd. Manipulator using a single motor driving plural flexible shafts. 4,964,303, Cl. 192-12.00D.

Niskanen, Toivo; and Reponen, Voitto, to A. Ahlstrom Corporation. Method and apparatus for dividing and uniting the flows of high-consistency fibre suspensions. 4,964,950, Cl. 162-100.000.

Nissan Motor Co., Ltd.: *See*—
Nishijima, Hirotaka; and Ugawa, Satoru, 4,964,238, Cl. 49-352.000.
Nishiyama, Toru; and Minakami, Hiroshi, 4,964,503, Cl. 192-12.00D.
Takeyama, Satoshi; and Matsumoto, Yasuo, 4,964,375, Cl. 123-315.000.

Nitta Industries Corporation: *See*—
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Nitto Chemical Industry Co., Ltd.: *See*—
Sasaki, Yutaka; Mori, Kunio; and Moriya, Kiyoshi, 4,965,393, Cl. 558-324.000.

Nitto Denko Corporation: *See*—
Shimatani, Shunichi; Yamamoto, Michiharu; Shimazu, Akira; and Iwama, Akio, 4,964,887, Cl. 55-16.000.

Nitto Kasei Co., Ltd.: *See*—
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Nitto Kohki Co., Ltd.: *See*—
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Niwa, Yukimasa: *See*—
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Nixon, Jeddy D.: *See*—
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No Fire Engineering, Inc.: *See*—
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Nobutani, Tohru; Nakamoto, Atsuhiro; Izumi, Hideo; and Miyano, Takahiro, to Matsushita Electric Works, Ltd. Method for forming conducting metal layer on inorganic substrate. 4,964,962, Cl. 204-192.300.

Noda, Seiichi: *See*—
Watanabe, Masayoshi; and Noda, Seiichi, 4,965,576, Cl. 341-94.000.

Noguchi, Kesao, to NEC Corporation. Liquid crystal display panel having a thin-film transistor array for displaying a high quality picture. 4,965,565, Cl. 340-784.000.

Noguchi, Takeki: *See*—
Yoshida, Hiroshi; Noguchi, Takeki; Ichikawa, Masahiko; Nakane, Takemi; Kubo, Kyoji; and Kinoshita, Kenichiro, 4,964,734, Cl. 374-14.000.

Nokia Unterhaltungselektronik: *See*—
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Nokubo, Seiji; Kohno, Teruhisa; Hashida, Koichi; Matsumoto, Atsuo; and Higashimura, Hideaki, to Sumitomo Electric Industries, Ltd. Flow control valve for antilock brake control device. 4,964,680, Cl. 303-115.000.

Nolan, John H.; and Skvarce, Dennis, to Alpha Industries, Inc. Shearing blade mount for cut-off die set. 4,964,327, Cl. 83-698.000.

Nolan, John H.; and Skvarce, Dennis, to Alpha Industries, Inc. Notching blade assembly. 4,964,328, Cl. 83-698.000.

Nolan, John H.: *See*—
Hartmann, Richard, Jr.; and Nolan, John H., 4,964,325, Cl. 83-321.000.

Nolan S.p.A.: *See*—
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Noll, Bernd: *See*—
Auracher, Franz; Ebberg, Alfred; Noll, Bernd; Meissner, Eckhard; and Rodler, Hermann-Johann, 4,965,857, Cl. 455-618.000.

Nomoto, Kazuhiro: *See*—
Inoue, Kunitoshi; Kawaguchi, Shigeru; and Nomoto, Kazuhiro, 4,964,293, Cl. 72-379.200.

Nomura, Shoichi; Kitagawa, Akira; Kawanishi, Hidekata; and Shibata, Tsuneo, to Matsushita Electric Industrial Co., Ltd.; Shima Trading Co., Ltd.; and Parker Kako Co., Ltd. Far-infrared heater. 4,965,434, Cl. 392-407.000.

Noranda Inc.: *See*—
Barnhurst, Robert J., 4,965,046, Cl. 420-519.000.

Norbeck, Dean K.; and Schnetzka, Harold R., II, to York International Corporation. System for mounting and cooling power semiconductor devices. 4,965,658, Cl. 357-79.000.

Nordhaus, John P., to Scot, Inc. Entrapped gas ejector arrangement for aircraft store racks. 4,964,595, Cl. 244-137.400.

Nordquist, Paul E. R., Jr.; and Singer, Arnold H., to United States of America, Navy. Preparation of ultra-pure metal halides. 4,965,055, Cl. 423-492.000.

Norkus, Norbert S.: *See*—
Warren, Harold C., III; Norkus, Norbert S.; and Smith-Lewis, Margaret J., 4,965,191, Cl. 435-7.000.

Norman Dryer Company, Inc.: *See*—
Coffman, Randall R., 4,964,228, Cl. 34-242.000.

Norman, Seth I.; Stringfield, Richard T.; and Gopsill, Christopher C., to Dow Chemical Company, The. Removal of bitterness from citrus

juices using a post-crosslinked adsorbent resin. 4,965,083, Cl. 426-422.000.
Normann, Norbert; Gross, Erwin; and Schlager, Harald, to Doduco Kg. Dr. Eugen Durrwachter. Thin, Planar shaped carrier with wiegand wires. 4,965,689, Cl. 360-131.000.
North American Philips Corporation: *See*—
Bradley, Ralph H., Jr., 4,964,695, Cl. 350-129.000.
North Central Plastics, Incorporated: *See*—
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Northern Telecom Limited: *See*—
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Dilley, James E., 4,965,881, Cl. 380-50.000.
Okura, David K.; Gauthier, John A.; Hill, Trevor R.; and MacKenzie, Simon A., 4,965,884, Cl. 375-106.000.
Norwood, Roger D.: *See*—
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Notenboom, Gerardus J. A. M.: *See*—
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Nottingham, Lawrence D.; Michaels, Thomas E.; and Michaels, Jennifer E., to Westinghouse Electric Co. Bore mapping and surface time measurement system. 4,964,295, Cl. 73-1.0DV.
Novick, William J.: *See*—
Mandell, Gerald L.; Sullivan, Gail W.; and Novick, William J., 4,965,271, Cl. 514-263.000.
Novy, Paul M., to PPG Industries, Inc. Method for producing 1-(trisubstituted silyl)azoles. 4,965,366, Cl. 548-110.000.
Nozuyama, Yasuyuki: *See*—
Nishimura, Akira; and Nozuyama, Yasuyuki, 4,965,511, Cl. 324-73.100.
Nueromedical Systems, Inc.: *See*—
Rutenberg, Mark R., 4,965,725, Cl. 364-413.100.
Nuesslein, Hans: *See*—
Jeschke, Peter; Kiewert, Eva; Nieendick, Claus; Nuesslein, Hans; and Sandkuehler, Peter, 4,965,014, Cl. 252-174.220.
Numbers, Jody L.: *See*—
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OCE Nederland B.V.: *See*—
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Ochi, Kumie: *See*—
Akasaka, Takeshi; Ochi, Kumie; Onari, Kazuhiro; Katsyama, Tsutomu; Furuta, Hitoshi; Nakae, Kazumi; and Fukuda, Satomi, 4,965,080, Cl. 426-104.000.
Oda, Takashi: *See*—
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O'Donovan, Robert; and Ippolito, Robert, to Cycle Products Company. Bicycle child carrier assembly. 4,964,551, Cl. 224-32.00A.
Oediger, Hermann: *See*—
Boshagen, Horst; Rosentreter, Ulrich; Lieb, Folker; Oediger, Hermann; Seuter, Friedel; Perzborn, Elisabeth; and Fiedler, Volker-Bernd, 4,965,258, Cl. 514-158.000.
Oehy, Peter; Brennwalder, Daniel; and Bachmann, Othmar, to Maschinenfabrik Rieter AG. Method and apparatus for piecing a reserve feed stock with a production feed stock. 4,964,267, Cl. 57-22.000.
Offenbacher, Helmut: *See*—
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Officine Meccaniche G. Cerutti S.p.A.: *See*—
Fantoni, Giuseppe; and Temporin, Daniele, 4,964,338, Cl. 101-378.000.
Ogasawara, Akira, to Nikon Corporation. Drive controlling apparatus. 4,965,502, Cl. 318-628.000.
Ogasawara, Minoru, to Iatron Laboratories, Inc. Thin-layer chromatography flame ionization detector for quantitative analysis of chromatographically-separated substances. 4,965,048, Cl. 422-54.000.
Ogata, Masatsugu; Segawa, Tadanori; Abe, Hidetoshi; Suzuki, Shigeo; and Kawata, Tatsuo, to Hitachi Ltd.; and Hitachi Chemical Co., Ltd. Resin encapsulated semiconductor device. 4,965,657, Cl. 357-72.000.
Ogawa, Hiroshi: *See*—
Ono, Toshio; Ogawa, Hiroshi; Mizuno, Chiaki; and Saito, Shinji, 4,965,120, Cl. 428-213.000.
Ogawa, Takeshi: *See*—
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Ogawa, Yoshihiro: *See*—
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Ogihara, Satoru; Kodama, Hironori; Ushifusa, Nobuyuki; and Otsuka, Kanji, to Hitachi, Ltd. Integrated circuit package having heat sink bonded with resinous adhesive. 4,965,660, Cl. 357-81.000.
Ogiwara, Nagao; and Nagumo, Akihiko, to Fuji Photo Film Co., Ltd. Image recording apparatus and method. 4,965,623, Cl. 355-27.000.
Oglesby, Oliver D.: *See*—
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Ogura, Masaaki; Ohta, Kiyotaka; Kurokawa, Junji; Ito, Masaji; and Hayasaka, Toshiaki, to Ricoh Company, Ltd. Continuous plural page copying method for a copier. 4,965,871, Cl. 355-55.000.
O'Hare, Harry, to HOH Water Technology Corp. Compact low volume water purification apparatus. 4,964,970, Cl. 204-301.000.
Ohi Seisakusho Co., Ltd.: *See*—
Nishijima, Hirotaka; and Ugawa, Satoru, 4,964,238, Cl. 49-352.000.
Ohigashi, Chiaki; Iemura, Shigeru; Shimamura, Kazuhiro; and Tanaka, Tetsuo, to Matsushita Graphic Communication Systems, Inc. Color image recording apparatus. 4,965,597, Cl. 346-157.000.
Ohmori, Naoto: *See*—
Hasegawa, Hirofumi; Ohmori, Naoto; Yamada, Yukio; and Yoshida, Narutaka, 4,965,870, Cl. 355-68.000.
Ohngemach, Jorg; and Zeh, Heiko, to Merck Patent Gesellschaft mit beschrankter Haftung. Photoinitiator dispersions. 4,965,294, Cl. 522-79.000.
Ohnishi, Osamu; Takahashi, Sadayuki; Myohga, Osamu; Uchikawa, Tadao; Inoue, Takeshi; Kagaya, Isao; and Ueha, Sadayuki, to NEC Corporation. Ultrasonic motor and method of adjusting the same. 4,965,482, Cl. 310-323.000.
Ohnishi, Toshikazu: *See*—
Kurabayashi, Yutaka; Ohnishi, Toshikazu; Yoshinaga, Kazuo; Mouri, Akihiro; Isaka, Kazuo; Kaneko, Shuzo; Eguchi, Takeo; and Toshida, Yomishi, 4,965,591, Cl. 346-108.000.
Ohno, Koichi: *See*—
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Ohta, Junichi: *See*—
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Ohta, Kiyotaka: *See*—
Ogura, Masaaki; Ohta, Kiyotaka; Kurokawa, Junji; Ito, Masaji; and Hayasaka, Toshiaki, 4,965,871, Cl. 355-55.000.
Ohta, Takayuki: *See*—
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Ohtsubo, Hiroshi: *See*—
Kiyota, Yoshisato; Ohta, Junichi; Ohtsubo, Hiroshi; and Takajo, Shigeaki, 4,964,907, Cl. 75-235.000.
Ohtsuka, Eiko: *See*—
Inoue, Hideo; Ohtsuka, Eiko; Imura, Akihiro; Masuda, Kenichi; and Kamimura, Takashi, 4,965,350, Cl. 536-28.000.
Ohtsuka, Yasumasa; Hasegawa, Hiroto; and Tanigawa, Koichi, to Canon Kabushiki Kaisha. Image forming apparatus. 4,965,747, Cl. 364-519.000.
Ohyabu, Keiji: *See*—
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Ojala, Timo: *See*—
Taipale, Kari; and Ojala, Timo, 4,964,584, Cl. 242-56.00R.
Oka, Masaaki; and Kurauchi, Yoshitaka, to Sony Corporation. Method and system for image transformation. 4,965,844, Cl. 382-44.000.
Okabayashi, Shigeo; Egawa, Mototaka; and Yuge, Masao, to UBE Industries, Ltd. Heat-curing cement composition, method of hardening same, and hardened body formed therefrom. 4,964,912, Cl. 106-705.000.
Okabe, Kazuo; Bokuta, Katsumi; and Morimoto, Hiroyuki, to Toray Industries, Inc. Polyester film. 4,965,307, Cl. 524-425.000.
Okada, Hisashi: *See*—
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Okada, Hitoshi, to Clarion Co., Ltd. Mode changing mechanism for a tape player. 4,964,589, Cl. 242-201.000.
Okada, Kazuo: *See*—
Tadokoro, Michihiro; and Okada, Kazuo, 4,965,785, Cl. 369-112.000.
Okada, Kouzou: *See*—
Watanabe, Tsuneo; and Okada, Kouzou, 4,965,503, Cl. 318-671.000.
Okada, Masahiro: *See*—
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Okamoto, Akihiro: *See*—
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Okamoto, Hiroo: *See*—
Tsuchida, Masami; Miyake, Ichiro; Takahashi, Tokihiro; Wakumura, Shinichi; Iso, Yoshimi; Arai, Takao; and Okamoto, Hiroo, 4,965,867, Cl. 341-118.000.
Okamoto, Shoji: *See*—
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Okamura, Koichi: *See*—
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Okano, Takashi: *See*—
Akiyama, Tohru; and Okano, Takashi, 4,965,781, Cl. 369-44.350.
Okanobu, Taiwa, to Sony Corporation. Cross-coupled differential amplifier. 4,965,528, Cl. 330-252.000.
Okawara, Atsuo: *See*—
Funami, Fumiyasu; Kitsunezuka, Akira; Arai, Shigeharu; Sakuma, Nobuhiro; Okawara, Atsuo; and Sugiura, Tomiya, 4,965,297, Cl. 523-217.000.
Okazaki, Masaki: *See*—
Kubodera, Seiiti; Ikegawa, Akihiko; and Okazaki, Masaki, 4,965,181, Cl. 430-550.000.
Okazaki, Yukio, to Kabushiki Kaisha Toshiba. Waveguide provided with double disk window assembly having dielectric disks. 4,965,541, Cl. 333-252.000.

Oki Electric Industry Co., Ltd.: *See—*
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Utsumi, Isao; and Mori, Yoshikazu, 4,965,724, Cl. 364-200.000.

Oki, Takehiko; Fukushima, Fumio; and Kawanami, Katsusuke, to Mitsubishi Jukogyo Kabushiki Kaisha. Coiler. 4,964,587, Cl. 242-78.100.

Okisi, Ryuichi: *See—*
Sugimoto, Masaru; Kohno, Osamu; Ikeno, Yoshimitsu; Sadakata, Nobuyuki; Nakagawa, Mikio; Aoki, Shin'ya; Tan, Masayuki; Okisi, Ryuichi; Yoshida, Syotaro; Hasegawa, Masakazu; and Yamanouchi, Hiroshi, 4,965,245, Cl. 505-1.000.

Oku, Teruo; Kawai, Yoshio; Kayakiri, Hiroshi; Kuratani, Kazuyoshi; and Hashimoto, Masashi, to Fujisawa Pharmaceutical Company, Ltd. Quinolyl methoxy compounds, processes for preparation thereof and pharmaceutical composition comprising the same. 4,965,274, Cl. 514-311.000.

Okura, David K.; Gauthier, John A.; Hill, Trevor R.; and MacKenzie, Simon A., to Northern Telecom Limited. Data alignment method and apparatus. 4,965,884, Cl. 375-106.000.

Oldani, Jerome L.: *See—*
Hollowed, Edward J.; and Oldani, Jerome L., 4,965,824, Cl. 379-428.000.

Oldham, David J., to Lutron Electronics Co., Inc. Quasi-constant gate drive circuit. 4,965,509, Cl. 323-300.000.

O'Leary, Timothy J.; and Brown, Roger R. Portable door securing device. 4,964,662, Cl. 292-295.000.

Olesik, Joseph T.: *See—*
Morton, Roger R. A.; and Olesik, Joseph T., 4,965,679, Cl. 358-462.000.

Olijslager, Jan: *See—*
Greidanus, Pieter J.; Feijen, Jan; Eenink, Marinus J. D.; Rieke, Johannes C.; Olijslager, Jan; and Albers, Jan H. M., 4,965,128, Cl. 428-398.000.

Olin Corporation: *See—*
Chang, Kin-Shiung; Armer, Thomas A.; and Bridges, William G., 4,965,227, Cl. 437-207.000.

Olin Hunt Specialty Products Inc.: *See—*
Nelsen, Barry F.; and Shyu, Jieh-Hwa, 4,964,959, Cl. 204-15.000.
Salamy, Thomas E., 4,965,167, Cl. 430-191.000.

Oliver, Donald: *See—*
Carr, Thomas G.; Oliver, Donald; James, John; and Rayfield, Robert, 4,964,804, Cl. 434-219.000.

Olivier, Errol: *See—*
Pratt, Charles F.; Phadke, Shrikant V.; and Olivier, Errol, 4,965,111, Cl. 428-36.800.

Olliver, Richard; Johnson, Cortlandt E.; and Patton, David L., to Eastman Kodak Company. Photographic film with latent image multi-field bar code and eye-readable symbols. 4,965,628, Cl. 355-41.000.

Olson, Keith E. Water insoluble encapsulated enzymes protected against deactivation by halogen bleaches. 4,965,012, Cl. 252-174.120.

Olson, Mary L. Clean up device. 4,964,188, Cl. 15-227.000.

Olson, Richard E.: *See—*
Cuomo, John; Greenberg, Richard S.; and Olson, Richard E., 4,965,280, Cl. 514-383.000.
Cuomo, John; Greenberg, Richard S.; and Olson, Richard E., 4,965,281, Cl. 514-399.000.

Oltz, Charles H.: *See—*
Coffey, Donald T.; Oltz, Charles H.; Roth, Donald D.; and Baran, Richard J., 4,964,525, Cl. 220-3.900.

Olympus Optical Co., Ltd.: *See—*
Hayashi, Shinichi, 4,964,707, Cl. 350-510.000.
Sakurai, Tomohisa, 4,965,532, Cl. 331-4.000.
Yamasaki, Masafumi; Toyofuku, Toshiyuki; Itoh, Junichi; and Kodama, Shinichi, 4,965,443, Cl. 250-201.700.

Omron Tateisi Electronics Co.: *See—*
Arao, Masaki; and Tsunemi, Shinichiro, 4,964,211, Cl. 29-705.000.

Omura, Masayuki; and Hamabata, Mitsuo, to Toyoda Gosei Co., Ltd. Method of manufacturing weatherstrip. 4,964,620, Cl. 264-261.000.

Onaka, Hiroshi: *See—*
Naito, Takao; Chikama, Terumi; Watanabe, Shigeki; Kiyonaga, Tetsuya; Onoda, Yoshihito; Kuwahara, Hideo; Onaka, Hiroshi; and Miyata, Hideyuki, 4,965,858, Cl. 455-619.000.

Onari, Kazuhiro: *See—*
Akasaka, Takeshi; Ochi, Kumie; Onari, Kazuhiro; Katayama, Tsutomu; Furuta, Hitoshi; Nakae, Kazumi; and Fukuda, Satomi, 4,965,080, Cl. 426-104.000.

Onda, Yoshiro; and Tanioka, Soji, to Shin-Etsu Chemical Co., Ltd. Novel photocurable and heat-curable polyvinyl butyral resin. 4,965,313, Cl. 525-59.000.

O'Neill, Gerard K., to Geostar Corporation. Position determination and message transfer system employing satellites and stored terrain map. 4,965,586, Cl. 342-357.000.

Ono, Hiroshi: *See—*
Ikeda, Minoru; Ishii, Masaki; Ono, Hiroshi; and Saito, Koichi, 4,965,114, Cl. 428-64.000.

Ono, Masato: *See—*
Karakida, Kenichi; Yagi, Shigeru; Fukuda, Yuzuru; Nishikawa, Masayuki; Roh, Te Nam; Takahashi, Noriyoshi; and Ono, Masato, 4,965,154, Cl. 430-58.000.

Ono, Toshio; Ogawa, Hiroshi; Mizuno, Chiaki; and Saito, Shinji, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,965,120, Cl. 428-213.000.

Onoda, Yoshihito: *See—*
Naito, Takao; Chikama, Terumi; Watanabe, Shigeki; Kiyonaga, Tetsuya; Onoda, Yoshihito; Kuwahara, Hideo; Onaka, Hiroshi; and Miyata, Hideyuki, 4,965,858, Cl. 455-619.000.

Ontawar, Susan P.: *See—*
Beck, Donald R.; Shelffo, Loren; and Ontawar, Susan P., 4,964,910, Cl. 106-21.000.

Onuki, Jin: *See—*
Koubuchi, Yasushi; Onuki, Jin; and Koizumi, Masahiro, 4,965,656, Cl. 357-71.000.

Oohashi, Keiji; Suzuki, Hideo; Araki, Shinji; and Shimomichi, Tsuyoshi, to Fujikura Ltd. Optical fiber and apparatus for producing same. 4,964,694, Cl. 350-96.330.

Orr, Ladd; Raleigh, Freddie L.; and Hemmelgarn, Thomas L., to Warner & Swasey Company, The. Coordinate measuring machine with cover system. 4,964,220, Cl. 33-503.000.

Osaka Bousi Construction Co., Ltd.: *See—*
Miyazaki, Yasuo; and Kamide, Akira, 4,965,036, Cl. 264-269.000.

Osawa, Izumi: *See—*
Hotomi, Hideo; Masaki, Kenji; Iino, Shuji; Osawa, Izumi; Fujiwara, Masanori; and Doi, Isao, 4,965,156, Cl. 430-66.000.

Osborn, Charles. Biodegradable disposable diaper. 4,964,857, Cl. 604-395.000.

Osborne, David B., Sr., to Continental Accessories, Inc. Running board light. 4,965,704, Cl. 362-81.000.

Osborne, William T., to Baltimore Aircoil Company. Cooling system with supplemental thermal storage. 4,964,279, Cl. 62-59.000.

Oshima, Shinji; and Misawa, Hidenobu, to NGK Insulators, Ltd. One end-sealed ceramic double wall-structural tubes. 4,965,107, Cl. 428-34.400.

Osinski, Kazimierz: *See—*
Gootzen, Wilhelmus F. M.; and Osinski, Kazimierz, 4,965,226, Cl. 437-189.000.

Ota, Yorito: *See—*
Inada, Masanori; Eda, Kazuo; Ota, Yorito; Nakagawa, Atsushi; and Yanagihara, Manabu, 4,965,650, Cl. 357-34.000.

Otake, Takeshi: *See—*
Tsukahara, Kengo; Otake, Takeshi; Saito, Masao; and Koseki, Toshio, 4,965,060, Cl. 423-376.000.

Otani, Takahide, to Sony Corporation. Cassette loading device for recording and/or reproducing apparatus. 4,965,683, Cl. 360-94.000.

Otani, Takuzo: *See—*
Karasawa, Michito; Uchimoto, Mari; Kawabe, Hirofumi; Otani, Takuzo; and Aizawa, Katsuo, 4,965,064, Cl. 424-9.000.

Otis Elevator Company: *See—*
Carr, Thomas G.; Oliver, Donald; James, John; and Rayfield, Robert, 4,964,804, Cl. 434-219.000.

Otis Engineering Corporation: *See—*
Wong, Kwok-Ping; and Davis, Glenn R., 4,964,610, Cl. 251-1.300.

Otsuka, Kanji; Kuroda, Shigeo; Sato, Katsuyuki; Nakamura, Hisashi; and Shouji, Shinichi, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corp. Semiconductor device and method of mounting the semiconductor device. 4,965,653, Cl. 357-55.000.

Otsuka, Kanji: *See—*
Ogihara, Satoru; Kodama, Hironori; Ushifusa, Nobuyuki; and Otsuka, Kanji, 4,965,660, Cl. 357-81.000.

Ott, Karl-Heinz: *See—*
Eichenauer, Herbert; Leitz, Edgar; and Ott, Karl-Heinz, 4,965,300, Cl. 525-415.000.

Otty, Macolm, to Automated Coil Systems Limited. Coil shapers for coils of rotating electric machines. 4,964,291, Cl. 72-298.000.

Overbergh, Noel M. M., to Raychem Corporation. Polyethylene alkyl acrylate adhesive composition. 4,965,320, Cl. 525-207.000.

Owerbach, David, to University of Massachusetts Medical School. Probes for the determination of the proclivity for development of autoimmune diseases. 4,965,189, Cl. 435-6.000.

Owsley, David P.: *See—*
Morris, Scott S.; Shramek, James F.; and Owsley, David P., 4,965,613, Cl. 346-25.000.

Owyoung, Adelbert: *See—*
Ashby, Carol I. H.; Hadley, G. Ronald; Hohimer, John P.; and Owyoung, Adelbert, 4,965,806, Cl. 372-45.000.

Oy Lohja AB: *See—*
Virtanen, Olli, 4,964,731, Cl. 366-11.000.

Oy Tampella AB: *See—*
Lamminen, Veikko; Hietikko, Erkki; and Kylmakorpi, Ilpo, 4,964,956, Cl. 162-203.000.
Taipale, Kari; and Ojala, Timo, 4,964,584, Cl. 242-56.00R.

Oyamada, Koichi: *See—*
Aonuma, Shigeo; and Oyamada, Koichi, 4,965,162, Cl. 430-110.000.

Ozawa, Yoshio, to Fuji Photo Film Co., Ltd. Device for mounting photographic negative carrier. 4,965,631, Cl. 355-75.000.

Paal, Michael: *See—*
Kolar, Cenek; Paal, Michael; Hermentin, Peter; and Kraemer, Hans P., 4,965,352, Cl. 536-6.400.

Paccoret, Claudio S.; and Crawford, Howard E., III. Composite aquatic board and manufacturing method. 4,964,825, Cl. 441-74.000.

Page, James C.: *See—*
Bennett, Paul T.; Willard, David F.; Tabernia, Omid; Page, James C.; Spiro, Alan I.; and Lambrecht, Frank E., 4,965,569, Cl. 340-825.440.

Pagones, Basil: *See—*
McCaleb, Frank D.; and Pagones, Basil, 4,965,505, Cl. 320-13.000.

Paitich, Ronald: *See—*
Sasnett, Michael W.; Paitich, Ronald; and Aurich, Edward L., 4,964,735, Cl. 374-32.000.

Palfreyman, Michael G.; Bey, Philippe; and McDonald, Ian A., to Merrell Dow Pharmaceuticals Inc. Inhibitors of lysyl oxidase. 4,965,288, Cl. 514-649.000.

Pall Corporation: *See—*
Gsell, Thomas C., 4,964,989, Cl. 210-490.000.
Pall, David B., 4,965,032, Cl. 264-160.000.

Pall, David B., to Pall Corporation. Filter device with non-bypass edge seal. 4,965,032, Cl. 264-160.000.

Palmer, Christopher J.: *See—*
Casida, John E.; Palmer, Christopher J.; Larkin, John P.; and Smith, Ian H., 4,965,257, Cl. 514-149.000.

Palmer, Gary E.: *See—*
Rau, Jerome E.; Palmer, Gary E.; and Labrador, Grace D., 4,964,189, Cl. 15-327.200.

Pan, Alfred I.; and Hanson, Eric G., to Hewlett-Packard Company. Amorphous diffusion barrier for thermal ink jet print heads. 4,965,611, Cl. 346-1.100.

Pangratz, Joachim: *See—*
Horpel, Gerhard; and Pangratz, Joachim, 4,965,326, Cl. 526-84.000.

Papierfabrik August Koehler AG: *See—*
Pietsch, Gunter; and Schrader, Karl-Heinz, 4,965,025, Cl. 264-4.700.

Paradies, Henrich H., to Medice Chem.-Pharm. Fabrik Putter GmbH & Co. KG. 2,5,6-substituted N_1-alkylpyrimidines. 4,965,357, Cl. 544-309.000.

Paraschuk, Jury S.: *See—*
Grischenko, Valentin I.; Kalugin, Jury V.; Paraschuk, Jury S.; Luchko, Nina A.; Chernysh, Elena N.; Tarasov, Valery F.; and Galchenko, Sergei E., 4,965,186, Cl. 435-2.000.

Park Poultry, Inc.: *See—*
Kessler, Lawrence J.; and Bolitho, Larry I., 4,964,194, Cl. 17-11.000.

Park, Sang Woo: *See—*
Kim, You Seung; Park, Sang Woo; and Kim, Jea Cheol, 4,965,396, Cl. 560-21.000.

Parker, David E.; and Malootian, Markay, to United States of America, Navy. Helical magnetostrictive core line hydrophone. 4,965,778, Cl. 367-168.000.

Parker Kako Co., Ltd.: *See—*
Nomura, Shoichi; Kitagawa, Akira; Kawanishi, Hidekata; and Shibata, Tsuneo, 4,965,434, Cl. 392-407.000.

Parker, Kent L., to Davidson Textron Inc. Self-skinned foam component for an inflatable restraint door assembly. 4,964,653, Cl. 280-732.000.

Parker, Wade: *See—*
Clark, Gary E., 4,964,219, Cl. 33-451.000.

Parshotam, Mahesh; Howard, Alan D.; Traulsen, Robert D.; Pennock, James L.; Hoo, James W.; and Masten, Michael M., to Huntron Instruments, Inc. System for digitizing and displaying analog signatures of integrated circuits. 4,965,516, Cl. 324-158.00R.

Patchen, Paul J., to National Semiconductor Corp. Glitch free clock select. 4,965,524, Cl. 328-72.000.

Patel, Ajitkumar G., to Dresser Industries, Inc. Jet spray slinger. 4,964,489, Cl. 184-13.100.

Patel, Punam M.; and Kaemmer, Bruce G., to Essex Group, Inc. System of assembly and filling large cables in a single pass at a single station. 4,964,363, Cl. 118-405.000.

Patel, Ramesh P.: *See—*
Muto, James A.; and Patel, Ramesh P., 4,964,778, Cl. 414-700.000.

Patin, Robert J.: *See—*
Chang, Donald C.; Wong, Mon N.; Patin, Robert J.; and Chang, Stanley S., 4,965,605, Cl. 343-700.0MS.

Patt, Paul J.; and Notenboom, Gerardus J. A. M., to U.S. Philips Corporation. Method of manufacturing a color display tube and a color display tube. 4,964,828, Cl. 445-4.000.

Patterson, Lawrence E.: *See—*
Chou, Ta-Sen; Heath, Perry C.; and Patterson, Lawrence E., 4,965,374, Cl. 549-313.000.

Patton, David L.: *See—*
Olliver, Richard; Johnson, Cortlandt E.; and Patton, David L., 4,965,628, Cl. 355-41.000.

Patton, Paul B.; and Kidder, Kenneth B., to Honeywell Inc. Method and apparatus for monitoring AC input signals. 4,965,755, Cl. 364-550.000.

Paul, Ana: *See—*
Paul, Marius A.; and Paul, Ana, 4,964,275, Cl. 60-605.100.

Paul, Marius A.; and Paul, Ana. Multicylinder compound engine. 4,964,275, Cl. 60-605.100.

Paulraj, Arogyaswami J.: *See—*
Roy, Richard H., III; Paulraj, Arogyaswami J.; and Kailath, Thomas, 4,965,732, Cl. 364-460.000.

Paulson, Kenneth R.: *See—*
Grimmer, Derrick P.; Paulson, Kenneth R.; and Gilbert, James R., 4,965,655, Cl. 357-71.000.

Pav, Josef; Wenzel, Reinhard; Bresser, Hans; and Vossmerbaumer, Rudolf, to Kleinewefers GmbH. Heatable roll for use in calenders and the like. 4,964,202, Cl. 29-116.200.

Pavelka, Bozidar: *See—*
Hoffrichter, Bernd; Pavelka, Bozidar; Pfefferkorn, Dietmar; Schaeffer, Norbert; and Goetz, Klaus, 4,964,588, Cl. 242-199.000.

Pavlick, Drew C., to SMS Engineering, Inc. Side trimmer shear. 4,964,324, Cl. 83-302.000.

Payne, Charles C., to Nalco Chemical Company. Cleaning of silicon wafers with an aqueous solution of KOH and a nitrogen-containing compound. 4,964,919, Cl. 134-2.000.

Payne, Mark B. Foldable playhouse with container-forming roof. 4,964,249, Cl. 52-70.000.

Pearman, Arthur N. J.; and Woessner, Michael A., to Gas Research Institute. Method and apparatus for calibration of electronic gas meters. 4,965,756, Cl. 364-571.010.

Peck, James V.: *See—*
Minaskanian, Gevork; and Peck, James V., 4,965,371, Cl. 548-952.000.

Pedlick, Jack: *See—*
Deniega, Jess; Vincze, Bela; and Pedlick, Jack, 4,964,559, Cl. 227-178.000.

Peguet, Pascal; Boulian, Eric; and Tarbouriech, Jean-Claude, to Motorola, Inc. Eprom low voltage sense amplifier. 4,965,473, Cl. 307-530.000.

Peischl, Mark L.; and Vinluan, Relan N., to Plessey Electronics Systems Corp. Digital differential phase-shift keyed decoder. 4,965,810, Cl. 375-80.000.

Pekelny, Anatol. Floating oil enclosure barriers an dispensing means aboard an oil tanker for discharging without the aid of surface vessels. 4,964,758, Cl. 405-66.000.

Pelly, Brian R.; Dubhashi, Ajit; and Ewer, Peter R., to International Rectifier Corporation. Insulated gate bipolar transistor power module. 4,965,710, Cl. 363-56.000.

Pennebaker, William B.; Anderson, Karen L.; and Mitchell, Joan L. V., to International Business Machines Corporation. Compression of binary halftones. 4,965,677, Cl. 358-429.000.

Pennock, James L.: *See—*
Parshotam, Mahesh; Howard, Alan D.; Traulsen, Robert D.; Pennock, James L.; Hoo, James W.; and Masten, Michael M., 4,965,516, Cl. 324-158.00R.

Pepe, Enrico J.: *See—*
Mohr, Paul H.; and Pepe, Enrico J., 4,965,334, Cl. 528-34.000.

Periaswamy, Ramamoorthy: *See—*
Krishna, Ashok S.; and Periaswamy, Ramamoorthy, 4,964,979, Cl. 208-253.000.

Perkin-Elmer Corporation, The: *See—*
Rotolico, Anthony J., 4,964,568, Cl. 239-8.000.

Perkins, Frank M. Infinitely variable transmission. 4,964,316, Cl. 475-215.000.

Permelec Electrode Ltd.: *See—*
Shimamune, Takayuki; and Hosonuma, Masashi, 4,965,088, Cl. 427-2.000.

Perrotto, Andre, to S M P 2 (Societe Anonyme de Droit Francais). Floating chuck with irrigating flow. 4,964,764, Cl. 409-136.000.

Personalized Mass Media Corporation, The: *See—*
Harvey, John C.; and Cuddihy, James W., 4,965,825, Cl. 380-9.000.

Perusich, Stephen A.: *See—*
Keating, James T.; and Perusich, Stephen A., 4,964,960, Cl. 204-98.000.

Perzan, Wayne A.: *See—*
Holtey, Thomas O.; Murray, Thomas L., Jr.; Perzan, Wayne A.; and Smith, Scott W., 4,965,721, Cl. 364-200.000.

Perzborn, Elisabeth: *See—*
Boshagen, Horst; Rosentreter, Ulrich; Lieb, Folker; Oediger, Hermann; Seuter, Friedel; Perzborn, Elisabeth; and Fiedler, Volker-Bernd, 4,965,258, Cl. 514-158.000.

Peter, Joseph R.: *See—*
Yang, Kei-Wean C.; Taggart, John E.; Hayes, Raymond; and Peter, Joseph R., 4,965,648, Cl. 357-24.000.

Peters, Edward N.; Bookbinder, Dana; and Cella, James A., to General Electric Company. Very high heat thermoplastic polyetherimides containing aromatic structure. 4,965,337, Cl. 528-353.000.

Peters, Joseph L., to Clini-Med Ltd.; and Clinical Product Development Ltd. Wound closure device. 4,964,417, Cl. 128-850.000.

Peters, Robert E.: *See—*
Ergott, Harold L., Jr.; Bruder, John F.; Peters, Robert E.; and Rainwater, Sam L., 4,965,828, Cl. 380-50.000.

Petersen, Robert J.: *See—*
Cadotte, John E.; Racchini, Joel-Raphael; and Petersen, Robert J., 4,964,998, Cl. 210-654.000.

Peterson, Donald L.: *See—*
Alexander, Thomas A.; Daher, Lawrence J.; Hancock, Clarence L.; and Peterson, Donald L., 4,965,072, Cl. 424-458.000.

Peterson, Edwin R. Leash retractor. 4,964,370, Cl. 119-109.000.

Peterson, Jon H.: *See—*
Mitchell, Glen R.; Mustain, Richard G.; Peterson, Jon H.; and Whitley, Lawrence D., 4,965,720, Cl. 364-200.000.

Petitjean, Pierre, to Ciba-Geigy Corporation. Productio installation for the manufacture of a product. 4,965,880, Cl. 364-468.000.

Petocz, Lujza: *See—*
Rozsa, Laszlo; Petocz, Lujza; Szirt nee Kiszelly, Eniko; Fekete, Marton; Szecsey nee Hegedus, Maria; Gigler, Gabor; and Gacsalyi, Istvan, 4,965,259, Cl. 514-183.000.

Petty, Charles C.: *See—*
Morse, Paul G.; and Petty, Charles C., 4,965,448, Cl. 250-252.100.

Petty, Norman W., to AT&T Bell Laboratories. Microprocessor-based substrate multiplexer/demultiplexer. 4,965,796, Cl. 370-112.000.

Pfefferkorn, Dietmar: *See—*
Hoffrichter, Bernd; Pavelka, Bozidar; Pfefferkorn, Dietmar; Schaeffer, Norbert; and Goetz, Klaus, 4,964,588, Cl. 242-199.000.

Pfister GmbH: *See—*
Hafner, Hans W., 4,965,729, Cl. 364-426.030.

Pfizenmayer, Henry L.: *See—*
Craft, Scott; Pfizenmayer, Henry L.; and Wernett, Frederick C., 4,965,526, Cl. 330-66.000.

Pfizer Inc.: *See*—
Cussans, Nigel J., 4,965,360, Cl. 546-145.000.
Dugger, Robert W., 4,965,372, Cl. 549-253.000.
Phadke, Shrikant V.: *See*—
Pratt, Charles F.; Phadke, Shrikant V.; and Olivier, Errol, 4,965,111, Cl. 428-36.800.
Pham, Tu-Anh: *See*—
Lancaster, Gerald M.; Pham, Tu-Anh; and Allen, James A., 4,965,314, Cl. 525-60.000.
Phelps, Douglas W., Jr.: *See*—
Karner, Friedrich A.; Phelps, Douglas W., Jr.; Starr, Stephen G.; and Ward, William C., 4,965,654, Cl. 357-70.000.
Philips & Du Pont Optical Company: *See*—
Legierse, Petrus E. J.; Beckers, Louis J. M.; and Landsbergen, Jeroen F. M., 4,964,958, Cl. 204-5.000.
Phillips Friedman Company: *See*—
Goetz, Kenneth D.; and Munro, Bradley L., 4,965,370, Cl. 548-555.000.
Phillips, Howard C.: *See*—
Giesbrecht, Wayne E.; Phillips, Howard C.; and Erb, David J., 4,964,200, Cl. 29-33.00M.
Phillips Petroleum Company: *See*—
Leininger, James C., 4,965,301, Cl. 524-101.000.
Roberts, John S., 4,965,236, Cl. 502-211.000.
Shaw, James E.; and Roberts, John S., 4,964,957, Cl. 203-6.000.
Phillips, Warren L.: *See*—
Sauter, Erich W.; Hamburg, John; and Phillips, Warren L., 4,965,089, Cl. 427-3.000.
Phillips, William C.; and Blair, James F. L., to Saint Switch, Inc. Switch actuator. 4,965,420, Cl. 200-341.000.
Picanol N.V.: *See*—
Tacq, Jo; Ligneel, Roger; and Shaw, Henry, 4,964,442, Cl. 139-452.000.
Van Bogaert, Philippe; Moeneclaey, Denis; and Lagache, Remi, 4,964,443, Cl. 139-453.000.
Picard, Bernard, to Commissariat a l'Energie Atomique. Method for the scanning confocal light-optical microscopic and indepth examination of an extended field and devices for implementing said method. 4,965,441, Cl. 250-201.300.
Picker International, Inc.: *See*—
Heuscher, Dominic J.; and Mattson, Rodney A., 4,965,726, Cl. 364-413.190.
Pidgeon, Rezin E., Jr.: *See*—
McKinney, Larry S.; and Pidgeon, Rezin E., Jr., 4,965,534, Cl. 331-37.000.
Pieper, Helmut: *See*—
Sorg, Helmut; Pieper, Helmut; and Kessel, Rudolf, 4,965,812, Cl. 373-36.000.
Pierce, Zona R.: *See*—
Nair, Mridula; Pierce, Zona R.; and DiPrima, Donna A., 4,965,131, Cl. 428-407.000.
Pietsch, Gunter; and Schrader, Karl-Heinz, to Papierfabrik August Koehler AG. Process for microencapsulating hydrophobic oils, the microcapsules obtained and the use thereof. 4,965,025, Cl. 264-4.700.
Pigneri, Anthony M.: *See*—
Jackson, Roy J.; and Pigneri, Anthony M., 4,965,331, Cl. 526-262.000.
Pigott, John M., to Motorola, Inc. Substrate injection clamp. 4,965,466, Cl. 307-296.200.
Pilawski, Kazimierz: *See*—
Karas, Wlodzimierz; Granowski, Robert; Ramotowski, Witold; Tuziemski, Aleksander; Cieplak, Jerzy; and Pilawski, Kazimierz, 4,964,403, Cl. 606-60.000.
Pinder, John T.: *See*—
Neal, Donald F.; Kearns, Michael W.; Fox, Stephen P.; Melville, James E.; Wright, Kenneth W.; Wood, Philip S.; Pinder, John T.; and Clark, Stephen C., 4,964,564, Cl. 228-107.000.
Pioneer Electronic Corporation: *See*—
Fukushima, Atsuhiko; Kashiwazaki, Takashi; Hosoi, Masayuki; and Ando, Hitoshi, 4,965,574, Cl. 340-995.000.
Murayama, Fumio; and Homma, Yoshiaki, 4,965,837, Cl. 381-186.000.
Tsuchida, Masami; Miyake, Ichiro; Takahashi, Tokihiro; Wakumura, Shinichi; Iso, Yoshimi; Arai, Takao; and Okamoto, Hiroo, 4,965,867, Cl. 341-118.000.
Pioneer Video Corporation: *See*—
Akiyama, Tohru; and Okano, Takashi, 4,965,781, Cl. 369-44.350.
Piraino, Martin P., Jr.: *See*—
Sobotka, Edward W., Jr.; and Piraino, Martin P., Jr., 4,965,414, Cl. 200-50.00A.
Piunno, Carmen; Livesey, Stephen; Linner, John G.; del Campo, Anthony A.; and Zaltzberg, Mark J., to Board of Regents. Method and apparatus for cryopreparing biological tissue. 4,964,280, Cl. 62-78.000.
Plastics One, Inc.: *See*—
Miller, Greg R., 4,964,816, Cl. 439-669.000.
Pless, Benjamin D.: *See*—
Carroll, Kenneth J.; and Pless, Benjamin D., 4,964,406, Cl. 128-419.00D.
Plessey Electronics Systems Corp.: *See*—
Peischl, Mark L.; and Vinluan, Relan N., 4,965,810, Cl. 375-80.000.
Plessey Overseas Limited: *See*—
Ridgewell, Peter, 4,964,199, Cl. 24-603.000.
Plombelec: *See*—
Ea, Willy, 4,964,772, Cl. 411-82.000.
Plumb, William W.: *See*—
Smith, Donald P.; Plumb, William W.; and High, Jarald E., 4,965,435, Cl. 219-388.000.
Poesch, William L. Flexible tunneling apparatus and method. 4,964,474, Cl. 175-74.000.
Poget Computer Corporation: *See*—
Cadwell, Peter F.; and Anglin, Noah L., 4,964,661, Cl. 292-87.000.
Polczynski, Mark H.: *See*—
Hink, Karl M.; and Polczynski, Mark H., 4,964,408, Cl. 128-633.000.
Polge, Steve: *See*—
Blackwell, Steven R.; Polge, Steve; Windham, Danny; and Bruce, Melvin, 4,965,641, Cl. 375-7.000.
Polis, Michael P.: *See*—
Liu, Gang; Huang, Hanchi; Siy, Pepe; and Polis, Michael P., 4,965,579, Cl. 341-159.000.
Polstorff, Walter, to United States of America, National Aeronautics and Space Adminstration. Electrostatically suspended rotor for angular encoder. 4,965,429, Cl. 219-121.680.
Polyol International BV: *See*—
Lidy, Werner A.; and Tenhagen, Rudolf J., 4,965,029, Cl. 264-45.100.
Polytype AG: *See*—
Aebersold, Rene, 4,964,361, Cl. 118-302.000.
Polzin, R. Stephen; Niles, Roger G.; and Lin, Rueysen, to Digital Equipment Corporation. Method and apparatus for interfacing a system control unit for a multi-processor. 4,965,793, Cl. 370-94.100.
Pontier, Renaud: *See*—
Mauleon, Jean-Louis; Siguad, Jean-Bernard; Pontier, Renaud; and Hoffmann, Frederic, 4,965,232, Cl. 502-43.000.
Poon, S. Joseph: *See*—
Shiflet, Gary J.; Poon, S. Joseph; and He, Yi, 4,964,927, Cl. 148-403.000.
Poplawski, Christopher, to Center for Orthotics Design, Inc. Hip-reciprocating apparatus. 4,964,628, Cl. 272-70.000.
Poppe, Ulrich; Schubert, Jurgen; and Evers, Wilhelm, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of fabricating thin layers from high-temperature oxide superconductors. 4,965,248, Cl. 505-1.000.
Porel, Louis C., to Hydro Rene Leduc. Rail car axle with axial hydraulic pump. 4,964,345, Cl. 105-96.100.
Port, Gary L.: *See*—
Kaelin, John J.; and Port, Gary L., 4,964,292, Cl. 72-453.170.
Posey, John: *See*—
Christine, William C.; Lyons, Steffen; Posey, John; Schmidt, Josef; and Herschman, George J., 4,964,944, Cl. 156-515.000.
Potts, David C.; Win, Maug H.; and Garvey, Lee P., to Kimberly-Clark Corporation. Fabric softener composition and laundry cleaning article containing same. 4,965,000, Cl. 252-8.750.
Poujois, Robert, to Commissariat a l'Energie Atomique. High dynamic analog to digital counter. 4,965,578, Cl. 341-156.000.
Poulin, Thomas R.: *See*—
Lott, John W.; Poulin, Thomas R.; and Wallace, Patrick W., 4,965,702, Cl. 361-401.000.
Powell, Walter, to Disco. Shuttle valve. 4,964,435, Cl. 137-625.410.
Powers, William J., III: *See*—
Schlicht, Raymond C.; and Powers, William J., III, 4,965,004, Cl. 252-38.000.
Poyer, Michael. Security device for a video recorder or player. 4,964,286, Cl. 70-58.000.
PPG Industries, Inc.: *See*—
Criss, Russell C., 4,964,963, Cl. 204-192.270.
Kania, Charles M.; Anderson, Carl C.; and Sharma, Brij N., 4,965,317, Cl. 525-155.000.
Neuman, George A.; and Bloss, Karl H., 4,965,093, Cl. 427-109.000.
Novy, Paul M., 4,965,366, Cl. 548-110.000.
Schaefer, William L., 4,964,891, Cl. 65-4.400.
Prakla-Seismos AG: *See*—
Marschall, Roland, 4,965,773, Cl. 367-15.000.
Prats, Christian: *See*—
Auclair, Michel; and Prats, Christian, 4,964,869, Cl. 623-23.000.
Pratt, Charles F.; Phadke, Shrikant V.; and Olivier, Errol, to General Electric Company. Olefinic impact modifiers for, and blends with, thermoplastic polyester resins. 4,965,111, Cl. 428-36.800.
Pratt, Karen L., to Miles Inc. Method of high temperature laundering using sodium citrate and an anionic. 4,965,013, Cl. 252-174.190.
Pratt, William E.: *See*—
Lamar, Richard S.; Pratt, William E.; Weber, Kenneth E.; and Roeder, Robert E., 4,964,955, Cl. 162-164.600.
Precision Handling Devices, Inc.: *See*—
Ferguson, Gregory A., 4,964,556, Cl. 226-74.000.
Prentice, John W., to Forethought Life Insurance Company. Telephone marketing device. 4,964,656, Cl. 281-44.000.
Prescott, Rochelle, to Smith & Nephew Dyonics, Inc. Fiber bundle illumination system. 4,964,692, Cl. 350-96.240.
Pressiai, Robert: *See*—
Murgue, Jean Pierre; Pressiai, Robert; and Robin, Leon, 4,964,723, Cl. 356-141.000.
Previdi, Robert. Leg rain protector. 4,964,176, Cl. 2-242.000.
Prevot, M. Gerard; Aumercier, M. Laurent; and Simoncelli, M. Philippe, to Ferco International Usine de Ferrures de Batiment. Locking device including locking, positioning, and sealing mechanisms. 4,964,660, Cl. 292-37.000.
Price, Charles S.; and Adams, John O. Electronic animal repellant apparatus. 4,965,552, Cl. 340-566.000.

Price Pfister, Inc.: *See*—
Gonzales, Teodoro J., 4,964,657, Cl. 285-8.000.

Priester, Claus-Ulrich: *See*—
Merger, Franz; Harder, Wolfgang; Hettinger, Peter; Priester, Claus-Ulrich; Franz, Dieter; and Voges, Dieter, 4,965,362, Cl. 546-246.000.

Prince, Paul R., to Baxter International Inc. Method and apparatus for estimating hematocrit in a blood constituent processing system. 4,964,847, Cl. 604-4.000.

Principia Recherche Developement S.A.: *See*—
Guevel, Pierre; Landel, Eric; Manzone, Jean-Michel; and Bouchet, Rene , 4,964,756, Cl. 405-26.000.

Process Automation Business, Inc.: *See*—
Sturm, Steven P., 4,965,452, Cl. 250-339.000.

Procter & Gamble Company, The: *See*—
Gipson, William P.; Mason, Michael W.; and Hensler, Thomas A., 4,964,860, Cl. 604-391.000.

Proctor & Gamble Company, The: *See*—
Wietfeldt, John R., 4,965,067, Cl. 424-52.000.

Prodel, Michel H. M. F.: *See*—
Francois, Pierre; and Prodel, Michel H. M. F., 4,964,813, Cl. 439-521.000.

ProtoCAD, Inc.: *See*—
Reed, Ronald G., 4,964,948, Cl. 156-659.100.

Puccio, Anthony J.: *See*—
Stachowiak, Robert W.; Puccio, Anthony J.; and Eberhart, Thomas J., 4,965,327, Cl. 526-88.000.

Pugh, J. Robert; and Matherly, James F., to Custom Industries, Inc. Forced air ventilating device. 4,964,566, Cl. 236-49.300.

Puhler, Alfred: *See*—
Muth, Gunter; Wohlleben, Wolfgang; Puhler, Alfred; Wohner, Gerhard; and Marquardt, Rudiger, 4,965,207, Cl. 435-320.000.

Pulwer, Mitchell J.: *See*—
Fields, Donald L., Jr.; Miller, William H.; and Pulwer, Mitchell J., 4,965,403, Cl. 562-17.000.

Purcell, David S.; and Wells, Kelley J. Fireplace construction. 4,964,397, Cl. 126-552.000.

Putterman, Seth: *See*—
Barmatz, Martin B.; Aveni, Glenn; Putterman, Seth; and Rudnick, Joseph, 4,964,303, Cl. 73-505.000.

Quadri Corporation: *See*—
Ergott, Harold L., Jr.; Bruder, John F.; Peters, Robert E.; and Rainwater, Sam L., 4,965,828, Cl. 380-50.000.

Qualcomm, Inc.: *See*—
Gilmore, Robert P., 4,965,533, Cl. 331-18.000.

Quartz & Silice: *See*—
Guibert, Paul; and Launay, Francis A. P., 4,964,902, Cl. 65-71.000.

Quash, Gerard A.; Rodwell, John D.; McKearn, Thomas J.; and Ripoll, Jean P. Oxidized viruses or viral antigens and utilization for diagnostic prophylactic and/or therapeutic applications. 4,965,069, Cl. 424-89.000.

Quentin-Millet, Marie-Jose B.; Arminjon, Francois; and Donikian, Roupen R., to Institut Merieux. Culture medium for bacteria of the bordetella genus containing etherified derivative of D-glucose and a cyclodextrin. 4,965,205, Cl. 435-252.000.

Querornes, Armel: *See*—
Kerherve, Jean-Pierre; and Querornes, Armel, 4,965,383, Cl. 556-104.000.

QuesTech, Inc.: *See*—
Wilmot, Donald W.; and Taylor, Robert T., 4,964,591, Cl. 244-3.160.

Quiniou, Jean-Francois: *See*—
Le Mehaute, Alain; Quiniou, Jean-Francois; Roques-Carmes, Claude; Wehbi, Dalloul; and Derossis, Antoine, 4,965,746, Cl. 364-518.000.

Quinn, Terrence A.: *See*—
Baker, Don L.; Gilda, Glenn D.; Quinn, Terrence A.; and Shaukatullah, Hussain, 4,964,737, Cl. 374-179.000.

R&D Association for Bioreactor System: *See*—
Shukunobe, Yukitaka; Nakamura, Tetsuo; Yoshida, Tomoe; Doki, Ryoichi; Kuwazuru, Mamoru; and Shimoda, Kouzou, 4,965,051, Cl. 422-145.000.

R.F. Belter Corporation: *See*—
Belter, Robert F., 4,964,367, Cl. 118-667.000.

Rabinovich, Eliezer M.: *See*—
Fratello, Vincent J.; Rabinovich, Eliezer M.; and Shmulovich, Joseph, 4,965,091, Cl. 427-64.000.

Racal Data Communications Inc.: *See*—
Trbovich, Nick G.; and Campbell, Thomas D., 4,965,804, Cl. 380-21.000.

Racchini, Joel-Raphael: *See*—
Cadotte, John E.; Racchini, Joel-Raphael; and Petersen, Robert J., 4,964,998, Cl. 210-654.000.

Radvan, Bronislaw: *See*—
Biggs, Ian S.; and Radvan, Bronislaw, 4,964,935, Cl. 156-242.000.

Rafique, Sajid: *See*—
Wrobel, Avi; Lodhie, Qamar; and Rafique, Sajid, 4,965,457, Cl. 362-249.000.

Raguenet, Gerard: *See*—
Lenormand, Regis; Billand, Marcel; Fraise, Pierre; Goupil, Jean-Claude; Raguenet, Gerard; and Rene, Didier, 4,965,587, Cl. 342-372.000.
Lenormand, Regis; Clerino, Antoine; Neron, Jacques; Marre, Jean-Philippe; and Raguenet, Gerard, 4,965,588, Cl. 342-372.000.

Rainwater, Sam L.: *See*—
Ergott, Harold L., Jr.; Bruder, John F.; Peters, Robert E.; and Rainwater, Sam L., 4,965,828, Cl. 380-50.000.

Raleigh, Freddie L.: *See*—
Orr, Ladd; Raleigh, Freddie L.; and Hemmelgarn, Thomas L., 4,964,220, Cl. 33-503.000.

Ramotowski, Witold: *See*—
Karas, Wlodzimierz; Granowski, Robert; Ramotowski, Witold; Tuziemski, Aleksander; Cieplak, Jerzy; and Pilawski, Kazimierz, 4,964,403, Cl. 606-60.000.

Rampart Packaging Inc.: *See*—
Coffman, Paul M., 4,964,205, Cl. 29-401.100.

Randall House: *See*—
House, Randall; and Covarrubias, Jesse, 4,964,750, Cl. 404-6.000.

Ransburg Corporation: *See*—
Howe, Varce E., 4,965,444, Cl. 250-205.000.

Rao, Tripuraneni N.: *See*—
Fritzberg, Alan R.; Kasina, Sudhakar; Rao, Tripuraneni N.; VanderHeyden, Jean-Luc; and Srinivasan, Ananthachari, 4,965,392, Cl. 558-254.000.

Rasmussen, James M., to Cummins-Allison Corporation. Pivoting tray for coin sorter. 4,964,495, Cl. 194-344.000.

Rath, Heinrich-Bernhard, to Lucas Industries Public Limited Co. Monitoring method and apparatus for a brake system of heavy-duty vehicles. 4,964,679, Cl. 303-100.000.

Rathi, Bharat D.: *See*—
George, David A.; and Rathi, Bharat D., 4,965,718, Cl. 364-200.000.

Ratner, Elizabeth L., to GTE Products Corporation. Scent-generating lamp using mating parts. 4,965,490, Cl. 313-569.000.

Ratti, Luigi; and Dall'Asta, Leone, to Biochimica OPOS SpA. Process for the prepartion of cefatrizine 1,2-propylene glycolate. 4,965,355, Cl. 540-226.000.

Rau, Jerome E.; Palmer, Gary E.; and Labrador, Grace D., to Hako Minuteman, Inc. Intake seal for tank vacuum cleaner. 4,964,189, Cl. 15-327.200.

Raulins, George M. Method and apparatus for gaging pipe threads. 4,964,305, Cl. 73-761.000.

Rauma Repola OY: *See*—
Saari, Tapio, 4,964,749, Cl. 403-169.000.

Rausch, Juergen: *See*—
Burgdorf, Jochen; Reinartz, Hans-Dieter; Steffes, Helmut; Von Hayn, Holger; Volz, Peter; Wupper, Hans; Buschmann, Gunther; Beck, Erhard; Dehio, Gottfried; Dinkel, Dieter; and Rausch, Juergen, 4,964,681, Cl. 303-116.000.

Ray, Wilson B.: *See*—
Vicari, Richard; Aslam, Mohammad; Ray, Wilson B.; Davenport, Kenneth G.; Dammel, Ralph; Lingnau, Juergen; and Doessel, Karl-Friedrich, 4,965,400, Cl. 560-130.000.

Rayborn, William L. Trolling motor foot control mounting system. 4,964,820, Cl. 440-7.000.

Raychem Corporation: *See*—
Overbergh, Noel M. M., 4,965,320, Cl. 525-207.000.

Rayfield, Robert: *See*—
Carr, Thomas G.; Oliver, Donald; James, John; and Rayfield, Robert, 4,964,804, Cl. 434-219.000.

Raymond Engineering Inc.: *See*—
Young, Paul R.; Richard, David W.; Treff, Arthur J.; and Staehly, Christopher E., 4,965,686, Cl. 360-98.070.

Raytheon Company: *See*—
Dorschner, Terry A.; and Resler, Daniel P., 4,964,701, Cl. 350-336.000.

RCA Licensing Corporation: *See*—
Canfield, Barth A.; and Fling, Russell T., 4,965,669, Cl. 358-171.000.
Deal, Samuel B.; and Bartch, Donald W., 4,965,096, Cl. 427-165.000.
Haferl, Peter E., 4,965,496, Cl. 315-371.000.
Wilber, James A.; and Smith, Lawrence E., 4,965,495, Cl. 315-371.000.

RCM Rubber Consulting & Machinery: *See*—
Holzer, Heinrich; and Wagner, Hans-Dieter, 4,964,729, Cl. 366-75.000.

Reed, Alastair: *See*—
Stansfield, Peter W.; and Reed, Alastair, 4,965,754, Cl. 364-526.000.

Reed, Brian: *See*—
Siemon, John A.; and Reed, Brian, 4,964,812, Cl. 439-403.000.

Reed, Ronald G., to ProtoCAD, Inc. Printed circuit board through hole technique. 4,964,948, Cl. 156-659.100.

Reeder, Gary D.; and Janicki, Michael J., to Electromedics, Inc. Blood filter. 4,964,984, Cl. 210-188.000.

Rees, David C.: *See*—
Horwell, David C.; and Rees, David C., 4,965,278, Cl. 514-414.000.

Reiland, Bernard F. Headlamp adjusting mechanism. 4,965,706, Cl. 362-66.000.

Reimann, Horst: *See*—
Taubitz, Christof; Seiler, Erhard; Hambrecht, Juergen; Mitulla, Konrad; and Reimann, Horst, 4,965,318, Cl. 525-179.000.

Reinalter, Franz: *See*—
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Reinartz, Hans-Dieter: *See*—
Burgdorf, Jochen; Reinartz, Hans-Dieter; Steffes, Helmut; Von Hayn, Holger; Volz, Peter; Wupper, Hans; Buschmann, Gunther; Beck, Erhard; Dehio, Gottfried; Dinkel, Dieter; and Rausch, Juergen, 4,964,681, Cl. 303-116.000.

Reinert, Gerhard; and Binz, Jorg, to Ciba-Geigy Corporation. Process for preventing yellowing of polyamide fibre materials treated with stain-blocking agents by treatment with water-soluble light stabilizer having fibre affinity. 4,964,871, Cl. 8-115.590.

Reinhard, Timothy D. Drive screw eye or hook. 4,964,602, Cl. 248-217.400.

Reiniche, Andre, to Compagnie Generale des Etablissements Michelin. Apparatus for heat treating a carbon steel wire. 4,964,621, Cl. 266-90.000.

Reis, Farrell L.; and Helms, Gayle A. Protective cover for a vehicle. 4,964,667, Cl. 296-95.100.

Reiter, John P. Vacuum pole sander. 4,964,243, Cl. 51-180.000.

Reiterman, Lee, to GTE Valenite Corporation. Dynamic differential drive. 4,964,322, Cl. 82-131.000.

Remond, Georges: *See*—
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Remuzon, Philippe: *See*—
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Rene, Didier: *See*—
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Repeat-O-Type Manufacturing Corporation: *See*—
Beck, Donald R.; Shelffo, Loren; and Ontawar, Susan P., 4,964,910, Cl. 106-21.000.

Reponen, Voitto: *See*—
Niskanen, Toivo; and Reponen, Voitto, 4,964,950, Cl. 162-100.000.

Resch, Reinhard, to Daimler-Benz Aktiengesellschaft. Brake unit. 4,964,676, Cl. 303-52.000.

Research, Incorporated: *See*—
Klinefelter, Gary M., 4,965,670, Cl. 358-183.000.

Resler, Daniel P.: *See*—
Dorschner, Terry A.; and Resler, Daniel P., 4,964,701, Cl. 350-336.000.

Reuter, Knud; Freitag, Dieter; Weymans, Gunther; Dhein, Rolf; Meier, Erich; and Muller, Gerold, to Bayer Aktiengesellschaft. Aromatic polyether ketones. 4,964,890, Cl. 55-158.000.

Reynolds Consumer Products, Inc.: *See*—
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Reynolds, Donald L.: *See*—
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Reynolds Metals Company: *See*—
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Rhode, Wilhelm, to Linde Aktiengesellschaft. Low-temperature separation of air using high and low pressure air feedstreams. 4,964,901, Cl. 62-13.000.

Rhone-Poulenc Chimie: *See*—
David, Claire; and Seon, Francoise, 4,965,057, Cl. 423-263.000.
Leveque, Alain; and Fitoussi, Richard, 4,964,996, Cl. 210-634.000.
Leveque, Alain; Fitoussi, Richard; and Sabot, Jean-Louis, 4,964,997, Cl. 210-634.000.

Richard, David W.: *See*—
Young, Paul R.; Richard, David W.; Treff, Arthur J.; and Staehly, Christopher E., 4,965,686, Cl. 360-98.070.

Richards, William D. Comparative surgical keratometer. 4,964,715, Cl. 351-212.000.

Richardson, Stephen B.: *See*—
Moxon, Neville T.; Torrance, Alstair C.; and Richardson, Stephen B., 4,964,329, Cl. 86-50.000.

Richmond, James W., to Emhart Industries, Inc. Automotive gearshift indicator. 4,964,359, Cl. 116-28.100.

Ricoh Company, Ltd.: *See*—
Bando, Toshiro, 4,965,634, Cl. 355-208.000.
Chang, Hershow; Kim, Seong; and Motoyama, Tetsuro, 4,965,748, Cl. 364-519.000.
Hashimoto, Mitsuru; Shimada, Tomoyuki; Suzuki, Nobuo; Sakai, Takayuki; Suzuka, Susumu; and Sasaki, Masaomi, 4,965,157, Cl. 430-80.000.
Katoh, Eiichi; Asakura, Koichi; Hasegawa, Yutaka; and Bando, Toshiro, 4,965,637, Cl. 355-246.000.
Ogura, Masaaki; Ohta, Kiyotaka; Kurokawa, Junji; Ito, Masaji; and Hayasaka, Toshiaki, 4,965,871, Cl. 355-55.000.
Shiraishi, Shuhei; and Hakiri, Minoru, 4,965,124, Cl. 428-327.000.
Wagatsuma, Yuki; and Kanno, Hiroshi, 4,965,744, Cl. 364-518.000.
Yamazaki, Shigeru, 4,965,590, Cl. 346-108.000.
Yano, Takashi, 4,965,792, Cl. 370-85.200.

Ricoh Corporation: *See*—
Chang, Hershow; Kim, Seong; and Motoyama, Tetsuro, 4,965,748, Cl. 364-519.000.

Ricoh Corporation and Ricoh Company, Ltd.: *See*—
Ejiri, Koichi; Jeng, Tina; Roth, Rithy; and Lam, Lak M., 4,965,676, Cl. 358-406.000.

Ridgewell, Peter, to Plessey Overseas Limited. Securing arrangement. 4,964,199, Cl. 24-603.000.

Riechelmann, Bernd, to Sym-Tek Systems, Inc. Electrical device contactor. 4,964,808, Cl. 439-264.000.

Rieke, Johannes C.: *See*—
Greidanus, Pieter J.; Feijen, Jan; Eenink, Marinus J. D.; Rieke, Johannes C.; Olijslager, Jan; and Albers, Jan H. M., 4,965,128, Cl. 428-398.000.

Riemann, Werner H. Liquid analyzer. 4,964,971, Cl. 204-403.000.

Rieter Machine Works Limited: *See*—
Meyer, Urs, 4,965,567, Cl. 340-825.160.

Riley, Dennis P.; and Rivers, Willie J., Jr., to Monsanto Company. Process for producing n-phosphonomethylglycine. 4,965,402, Cl. 562-17.000.

Riley, Rupert A. Multiple keyboard switch. 4,965,560, Cl. 340-717.000.

Riley, Thomas A. D., to Carleton University. Frequency synthesizers having dividing ratio controlled by sigma-delta modulator. 4,965,531, Cl. 331-1.00A.

Ring, Ralph D., to Goodyear Tire & Rubber Company, The. Tire bead setter apparatus and method. 4,964,931, Cl. 156-131.000.

Ripoll, Jean P.: *See*—
Quash, Gerard A.; Rodwell, John D.; McKearn, Thomas J.; and Ripoll, Jean P., 4,965,069, Cl. 424-89.000.

Ritchie, David S., to Barr & Stroud Limited. Radiation receiving mast. 4,964,724, Cl. 356-152.000.

Ritger, Philip L.: *See*—
Lysaght, Michael J.; Boggs, Daniel R.; and Ritger, Philip L., 4,964,976, Cl. 210-650.000.

Ritter, Robert: *See*—
Blankenship, William P.; Ritter, Robert; and Schmitten, Phillip F., 4,964,277, Cl. 62-3.200.

Rivers, Willie J., Jr.: *See*—
Riley, Dennis P.; and Rivers, Willie J., Jr., 4,965,402, Cl. 562-17.000.

Roath, Alan L.: *See*—
Tengler, John N.; Roath, Alan L.; and Venaleck, John T., 4,964,814, Cl. 439-607.000.

Robert Bosch GmbH: *See*—
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Fabry, Ehrenfried; Goddard, George; and Meyer, Dieter, 4,965,564, Cl. 340-784.000.
Moser, Theodor; and Krieger, Eberhard, 4,964,262, Cl. 53-506.000.
Schueler, Hans; Lauterbach, Heinz; Tschoeke, Helmut; Kinzel, Richard; and Stipek, Theodor, 4,964,789, Cl. 417-494.000.

Robert, Jean-Louis: *See*—
Mosser, Vincent; and Robert, Jean-Louis, 4,965,697, Cl. 361-283.000.

Roberts, Edward A.; Spittal, Douglas W.; and Kisiel, Stanley T., to Color Custom, Inc. Unitary composite molding strip. 4,965,103, Cl. 428-31.000.

Roberts, John S., to Phillips Petroleum Company. Process for producing a catalyst. 4,965,236, Cl. 502-211.000.

Roberts, John S.: *See*—
Shaw, James E.; and Roberts, John S., 4,964,957, Cl. 203-6.000.

Robicsek, Francis. Two-way suction apparatus for surgical procedures. 4,964,849, Cl. 604-35.000.

Robin, Leon: *See*—
Murgue, Jean Pierre; Pressiai, Robert; and Robin, Leon, 4,964,723, Cl. 356-141.000.

Robinson, Earl F.: *See*—
Todd, Joseph J.; Robinson, Earl F.; and Bare, Rex O., 4,964,855, Cl. 604-283.000.

Robinson, Mark D.: *See*—
Farrell, Eugene A.; and Robinson, Mark D., 4,964,447, Cl. 144-176.000.

Robinson, Victor G., to Mid-West Conveyor Company, Inc. Side link pusher dog with lubrication passage. 4,964,344, Cl. 104-172.500.

Robison, Gary L.; and Wash, Michael L., to Eastman Kodak Company. Printing and makeover process for magnetically encodable film with dedicated magnetic tracks. 4,965,626, Cl. 355-40.000.

Robison, Gary L., to Eastman Kodak Company. Film information exchange system using dedicated magnetic tracks on film with virtual data indentifiers. 4,965,627, Cl. 355-40.000.

Roby Teknik Aktiebolag: *See*—
Hanerus, Goran; and Ljungstrom, Tommy, 4,964,444, Cl. 141-90.000.

Rockwell, Gary L., to Diversified Products Corporation. Compact multi-function weight-training exerciser. 4,964,632, Cl. 272-118.000.

Rockwell International Corporation: *See*—
Hayes, Cecil L., 4,965,805, Cl. 372-32.000.
Hong, John H.; and McMichael, Lan C., 4,965,603, Cl. 342-372.000.

Roddy, James E.; Narayan, Badhri; and Granger, Edward M., to Eastman Kodak Company. Scanning apparatus for halftone image screen writing. 4,965,599, Cl. 346-160.000.

Rodgers, Joel E.: *See*—
Swan, Ellen L.; Basu, Rajat S.; and Rodgers, Joel E., 4,965,011, Cl. 252-171.000.

Rodi, Anton; and Kruger, Michael, to Heidelberger Druckmaschinen AG. Control circuit for an electric drive motor. 4,965,497, Cl. 318-372.000.

Rodler, Hermann-Johann: *See*—
Auracher, Franz; Ebberg, Alfred; Noll, Bernd; Meissner, Eckhard; and Rodler, Hermann-Johann, 4,965,857, Cl. 455-618.000.

Rodwell, John D.: *See*—
Quash, Gerard A.; Rodwell, John D.; McKearn, Thomas J.; and Ripoll, Jean P., 4,965,069, Cl. 424-89.000.

Roeder, Robert E.: *See*—
Lamar, Richard S.; Pratt, William E.; Weber, Kenneth E.; and Roeder, Robert E., 4,964,955, Cl. 162-164.600.

Rogala, Richard L.; and Tame, Omar D., to Hoover Universal, Inc. Vehicle seat adjuster with integral positive locking traveling seat belt anchorage. 4,964,608, Cl. 248-429.000.

Rogers, Howard H.; and Stadnick, Steven J., to Hughes Aircraft Company. Electrical storage cell resistant to freezing. 4,965,145, Cl. 429-101.000.

Rogers, Michael D.: *See*—
Moedritzer, Kurt; and Rogers, Michael D., 4,964,895, Cl. 71-92.000.

Roh, Te Nam: *See*—
Karakida, Kenichi; Yagi, Shigeru; Fukuda, Yuzuru; Nishikawa, Masayuki; Roh, Te Nam; Takahashi, Noriyoshi; and Ono, Masato, 4,965,154, Cl. 430-58.000.

Rohm GmbH Chemische Fabrik: *See*—
Siol, Werner; and Terbrack, Ulrich, 4,965,783, Cl. 369-100.000.

Rohm and Haas Company: *See*—
Hsu, Jemin C., 4,964,892, Cl. 71-67.000.

Rohto Pharmaceutical Co., Ltd.: *See*—
Kametaka, Shigeru; Miyazaki, Tadaaki; Hayashi, Shinichi; Handa, Akira; and Kameda, Kinya, 4,965,262, Cl. 514-230.200.

Rolli, Karl: *See*—
Heyland, Sven; Rolli, Karl; Roschli, David; and Sihver, Jaak J., 4,965,085, Cl. 426-533.000.

Rolls-Royce plc: *See*—
Bagnall, Adam, 4,964,844, Cl. 475-295.000.
Taylor, David H.; and Lyons, Michael R., 4,964,270, Cl. 60-39.094.

Rolph, Donald L.: *See*—
Thompson, Herbert E.; Rolph, Donald L.; Mercurio, Dominic; and Guerini, Albert J., 4,965,685, Cl. 360-97.010.

Romeo, Aurelio: *See*—
della Valle, Francesco; and Romeo, Aurelio, 4,965,353, Cl. 536-55.100.

Rommelfaenger, Peter R.; and Neuwirth, Thomas A., to E. R. Wagner Manufacturing Company. Hinge. 4,964,193, Cl. 16-225.000.

Roos, Annika M.: *See*—
Hagenfeldt, Carl P. U.; and Roos, Annika M., 4,964,925, Cl. 148-325.000.

Roovers, Wilhelmus M. M.; and Verhoeven, Jeroen J., to General Electric Company. Polymer mixture comprising an aromatic polycarbonate, an aromatic polyester and an inorganic sulfur compound. 4,965,308, Cl. 524-421.000.

Rope, Christopher C.; and Rope, Pamela A., to Handbury Limited. Duckboard. 4,964,751, Cl. 404-35.000.

Rope, Pamela A.: *See*—
Rope, Christopher C.; and Rope, Pamela A., 4,964,751, Cl. 404-35.000.

Roques-Carmes, Claude: *See*—
Le Mehaute, Alain; Quiniou, Jean-Francois; Roques-Carmes, Claude; Wehbi, Dalloul; and Derossis, Antoine, 4,965,746, Cl. 364-518.000.

Roschli, David: *See*—
Heyland, Sven; Rolli, Karl; Roschli, David; and Sihver, Jaak J., 4,965,085, Cl. 426-533.000.

Rosentreter, Ulrich: *See*—
Boshagen, Horst; Rosentreter, Ulrich; Lieb, Folker; Oediger, Hermann; Seuter, Friedel; Perzborn, Elisabeth; and Fiedler, Volker-Bernd, 4,965,258, Cl. 514-158.000.

Rossi, Giuseppina: *See*—
Timossi, Gian Maria; Rossi, Giuseppina; and Dell'Orto, 4,965,777, Cl. 367-140.000.

Rossi, Jean-Louis. Retaining wall adapted to be provided with vegetation, comprising openings serving as a concealed framing for concrete. 4,964,761, Cl. 405-286.000.

Rossiter, Gordon J.: *See*—
Berry, William W.; and Rossiter, Gordon J., 4,965,061, Cl. 423-484.000.

Rosso, Michele: *See*—
Bottau, Francoise; Galand, Claude; and Rosso, Michele, 4,965,789, Cl. 370-79.000.

Rosy B. Versand GmbH: *See*—
Gloor, Peter, 4,964,839, Cl. 464-29.000.

Roth, Bruce A.: *See*—
Roth, Paul E.; and Roth, Bruce A., 4,965,864, Cl. 318-135.000.

Roth, Donald D.: *See*—
Coffey, Donald T.; Oltz, Charles H.; Roth, Donald D.; and Baran, Richard J., 4,964,525, Cl. 220-3.900.

Roth, Paul E.; and Roth, Bruce A. Linear motor. 4,965,864, Cl. 318-135.000.

Roth, Rithy: *See*—
Ejiri, Koichi; Jeng, Tina; Roth, Rithy; and Lam, Lak M., 4,965,676, Cl. 358-406.000.

Rotolico, Anthony J., to Perkin-Elmer Corporation, The. Shrouded thermal spray gun and method. 4,964,568, Cl. 239-8.000.

Rowlette, John R., to AMP Incorporated. System for selective laser assisted plating. 4,964,698, Cl. 350-320.000.

Roy, Richard H., III; Paulraj, Arogyaswami J.; and Kailath, Thomas, to Leland Stanford Junior University, The Board of Trustees of the. Methods and arrangements for signal reception and parameter estimation. 4,965,732, Cl. 364-460.000.

Royce Medical Company: *See*—
Grim, Tracy E.; and Haines, Jeffrey R., 4,964,402, Cl. 128-80.00H.

Rozsa, Laszlo; Petocz, Lujza; Szirt nee Kiszelly, Eniko; Fekete, Marton; Szecsey nee Hegedus, Maria; Gigler, Gabor; and Gacsalyi, Istvan, to EGIS Gyogyszergyar. Dioxazocine derivatives compositions and methods containing them having antidepressive, spasmolytic, anticonvulsive, and antiarrhythmic properties. 4,965,259, Cl. 514-183.000.

RPG Diffusor Systems, Inc.: *See*—
D'Antonio, Peter; and Konnert, John H., 4,964,486, Cl. 181-285.000.

Rubinstein, Israel: *See*—
Sagiv, Jacob; Rubinstein, Israel; Steinberg, Suzi; Shanzer, Abraham; and Tor, Yitzhak, 4,964,972, Cl. 204-418.000.

Ruble, Frank D.; Stearman, Roger R.; and Smith, Robert A., to Exclusive Design Company. Apparatus for texturing rigid-disks used in digital magnetic recording systems. 4,964,242, Cl. 51-144.000.

Ruchs, Gerhard H.: *See*—
Baughman, Ray H.; Buff, Ernest D.; Eckhardt, Helmut; and Ruchs, Gerhard H., 4,964,251, Cl. 52-171.000.

Rudnick, Joseph: *See*—
Barmatz, Martin B.; Aveni, Glenn; Putterman, Seth; and Rudnick, Joseph, 4,964,303, Cl. 73-505.000.

Rudy, Issac. Floatation device for swimmers. 4,964,827, Cl. 441-59.000.

Ruf, Erich, to Th. Goldschmidt AG. Liquid preparation for the production of electrically conductive and infrared-reflecting fluorine-doped tin oxide layers on glass or glass-ceramic surfaces, as well as a method for the production of such layers. 4,965,137, Cl. 428-432.000.

Ruggeberg, Klaus; and Jose, Horst-Udo, to Varta Batterie Aktiengesellschaft. Insulation sleeve for galvanic primary cells. 4,965,105, Cl. 428-34.200.

Ruppert, Franz: *See*—
Maier, Manfred; Ruppert, Franz; and Schwab, Joachim, 4,964,299, Cl. 73-146.000.

Rushefsky, Norman, to Eastman Kodak Company. Digitizer apparatus and method. 4,965,635, Cl. 355-218.000.

Rushing, Allen J.; Clar, Donald J., Jr.; and Sherwood, Walter B., to Eastman Kodak Company. Electrostatographic machine with screening. 4,965,636, Cl. 355-239.000.

Russell, A. G.: *See*—
Collins, Walter W., 4,964,554, Cl. 224-232.000.

Russo, Donald P., to Hi-Tek Polymers, Inc. Process for forming stable emulsions of water soluble polysaccharides in hydrocarbon liquids. 4,964,999, Cl. 252-8.551.

Ruszala-Mallon, V. M.: *See*—
Nair, Vijay G.; Conrow, Ramson B.; Wang, Bosco S.; and Ruszala-Mallon, V. M., 4,965,284, Cl. 514-443.000.

Rutenberg, Mark R., to Nueromedical Systems, Inc. Neural network based automated cytological specimen classification system and method. 4,965,725, Cl. 364-413.100.

Ryan, Rodger, to General Electric Company. Signal converter circuit. 4,965,547, Cl. 340-870.350.

Rzehak, H.: *See*—
Helmling, Oswald; Arnold, G.; Rzehak, H.; Fahey, George C., Jr.; Berger, Larry L.; Merchen, Neal R.; Medina, Joha; and Moerck, Rudi, 4,965,086, Cl. 426-636.000.

S.A.M.M.-Societe d'Applications des Machines Motrices: *See*—
Joseph, Philippe, 4,964,492, Cl. 188-299.000.

S.I.C.A.M.E. Societe Industrielle de Construction: *See*—
Francois, Pierre; and Prodel, Michel H. M. F., 4,964,813, Cl. 439-521.000.

S M P 2 (Societe Anonyme de Droit Francais): *See*—
Perrotto, Andre, 4,964,764, Cl. 409-136.000.

Saari, Tapio, to Rauma Repola OY. Joint piece. 4,964,749, Cl. 403-169.000.

Sabot, Jean-Louis: *See*—
Leveque, Alain; Fitoussi, Richard; and Sabot, Jean-Louis, 4,964,997, Cl. 210-634.000.

Saccocio, Edward J.; Varde, Uday; Hutchings, David A.; and Messer, Russell K., to Mead Corporation, The. Donor media shelf life stabilization by control of exposure to contacting oxygen and moisture. 4,965,165, Cl. 430-138.000.

Sadakata, Nobuyuki: *See*—
Sugimoto, Masaru; Kohno, Osamu; Ikeno, Yoshimitsu; Sadakata, Nobuyuki; Nakagawa, Mikio; Aoki, Shin'ya; Tan, Masayuki; Okiai, Ryuichi; Yoshida, Syotaro; Hasegawa, Masakazu; and Yamanouchi, Hiroshi, 4,965,245, Cl. 505-1.000.

Sadler, Robert A.: *See*—
Geissberger, Arthur E.; Sadler, Robert A.; Luper, Paulette; and Balzan, Matthew L., 4,965,218, Cl. 437-41.000.

Saegusa, Takashi: *See*—
Takagi, Tadao; Sato, Toshihiro; and Saegusa, Takashi, 4,965,620, Cl. 354-416.000.

Saeki, Kazumi; Inoue, Takeshi; and Horie, Shoichi, to Yoshitomi Pharmaceutical Industries, Ltd. P-oxybenzoic acid compounds. 4,965,395, Cl. 560-11.000.

Sagae, Kyuta: *See*—
Sugiyama, Yoshiaki; and Sagae, Kyuta, 4,964,853, Cl. 604-96.000.

Sagaser, Thomas M., to Clark Equipment Company. Electronic bucket positioning and control system. 4,964,779, Cl. 414-708.000.

Sagiv, Jacob; Rubinstein, Israel; Steinberg, Suzi; Shanzer, Abraham; and Tor, Yitzhak, to Yeda Research and Development Company Limited. Ionic recognition and selective response in self assembling monolayer membranes on electrodes. 4,964,972, Cl. 204-418.000.

Saiki, Randall K.: *See*—
Mullis, Kary B.; Erlich, Henry A.; Gelfand, David H.; Horn, Glenn; and Saiki, Randall K., 4,965,188, Cl. 435-6.000.

Saint-Gobain Vitrage: *See*—
Kerherve, Jean-Pierre; and Queromes, Armel, 4,965,383, Cl. 556-104.000.

Saint Switch, Inc.: *See*—
Phillips, William C.; and Blair, James F. L., 4,965,420, Cl. 200-341.000.

Saischek, Gerald: *See*—
Schermanz, Karl; Saischek, Gerald; Kores, Dietmar; Graf, Josef; Haas, Gerhard; and Martetschlager, Kurt, 4,965,277, Cl. 514-385.000.

Saito, Hitoshi: *See*—
Abe, Toshio; Takahashi, Seiichi; Kamihara, Masaharu; Saito, Hitoshi; Tanaka, Seizo; and Suzuki, Yasuyuki, 4,965,483, Cl. 310-324.000.

Saito, Koichi: *See*—
Ikeda, Minoru; Ishii, Masaki; Ono, Hiroshi; and Saito, Koichi, 4,965,114, Cl. 428-64.000.

Saito, Masao: *See*—
Tsukahara, Kengo; Otake, Takeshi; Saito, Masao; and Koseki, Toshio, 4,965,060, Cl. 423-376.000.

Saito, Shinji: *See*—
Ono, Toshio; Ogawa, Hiroshi; Mizuno, Chiaki; and Saito, Shinji, 4,965,120, Cl. 428-213.000.

Saito, Takanori: *See*—
Ebe, Kazuyoshi; Narita, Hiroaki; Taguchi, Katsuhisa; Akeda, Yoshitaka; and Saito, Takanori, 4,965,127, Cl. 428-343.000.

Saito, Takayoshi: *See*—
Arai, Tatsuo; and Saito, Takayoshi, 4,964,762, Cl. 407-34.000.

Saitoh, Hiroyuki; and Murakami, Tsugio, to Tosoh Corporation. Granular calcuim hypochlorite composition and process for preparation thereof. 4,965,016, Cl. 252-186.370.

Saka, Terumasa: *See*—
Ikeda, Takashi; Takagishi, Hisao; and Saka, Terumasa, 4,964,872, Cl. 8-115.660.

Sakai, Jun: *See*—
Sakakibara, Kenji; Ueda, Masashi; Ishikawa, Shigeki; Sakai, Jun; and Izaki, Takeshi, 4,965,625, Cl. 355-35.000.

Sakai, Takayuki: *See*—
Hashimoto, Mitsuru; Shimada, Tomoyuki; Suzuki, Nobuo; Sakai, Takayuki; Suzuka, Susumu; and Sasaki, Masaomi, 4,965,157, Cl. 430-80.000.

Sakaki, Mamoru; Nakatsugawa, Tomomi; Koike, Shoji; and Sato, Hiroshi, to Canon Kabushiki Kaisha. Ink-jet recording system and ink-jet recording method. 4,965,612, Cl. 346-1.100.

Sakakibara, Kenji; Ueda, Masashi; Ishikawa, Shigeki; Sakai, Jun; and Izaki, Takeshi, to Brother Kogyo Kabushiki Kaisha. Image forming apparatus having image forming data inputting device. 4,965,625, Cl. 355-35.000.

Sakakibara, Kenji: *See*—
Sangyoji, Kazuo; Yamamoto, Takemi; Hatta, Naoyuki; Sakakibara, Kenji; Asano, Yuji; Hara, Yoshimasa; Matsumoto, Yumio; and Hayakawa, Kiyoharu, 4,965,592, Cl. 346-110.00R.

Sakamoto, Hideno ra, to Mitsubishi Denki Kabushiki Kaisha. Magnetic resonance imagi g method. 4,965,520, Cl. 324-309.000.

Sakamoto, Yukio; T be, Takeshi; Fukutani, Iwao; and Hori, Toshio, to Murata Manuf turing Co., Ltd. Surface-mounting connector. 4,964,806, Cl. 439-79.000.

Sakanoue, Hitoyuki: *See*—
Sasame, Akira; Sakanoue, Hitoyuki; Miyake, Masaya; and Yamakawa, Akira, 4,965,659, Cl. 357-81.000.

Sakasai, Yutaka: *See*—
Suzuki, Nobuo; Sakasai, Yutaka; and Usui, Tetuo, 4,965,163, Cl. 430-114.000.

Sakashita, Motoki: *See*—
Yoshitake, Akira; and Sakashita, Motoki, 4,964,924, Cl. 148-325.000.

Sakata, Kazuhiro: *See*—
Tanaka, Akira; Fukamachi, Masaaki; and Sakata, Kazuhiro, 4,965,460, Cl. 307-10.200.

Saki, Yosinori; Kotera, Hiroshi; Unemoto, Kazuo; Arikawa, Tomohiko; Jung, Wayne; Tutt, Timothy; and Dunk, Mike, to Interand Corporation; and Nippon Telegraph and Telephone Corp. Method and apparatus for image retrieval. 4,965,558, Cl. 340-712.000.

Sakuma, Nobuhiro: *See*—
Funami, Fumiyasu; Kitsunezuka, Akira; Arai, Shigeharu; Sakuma, Nobuhiro; Okawara, Atsuo; and Sugiura, Tomiya, 4,965,297, Cl. 523-217.000.

Sakuso, Fumihiko; Sonoda, Hirofumi; Honda, Satoshi; and Kumagae, Ryouhei, to Nippon Steel Welding Products & Engineering Co., Ltd. Apparatus for manufacturing powder. 4,964,791, Cl. 425-8.000.

Sakurai, Tomohisa, to Olympus Optical Co., Ltd. Circuit for driving ultrasonic transducer. 4,965,532, Cl. 331-.000.

Sakuranaga, Masanori: *See*—
Arai, Ryuichi; Haruta, Masahiro; Yamamoto, Nobuko; Yano, Tetsuya; Kishi, Hiroyoshi; and Sakuranaga, Masanori, 4,965,174, Cl. 430-340.000.

Salamy, Thomas E., to Olin Hunt Specialty Products, Inc. Positive-working photoresist employing a selected mixture of ethyl lactate and ethyl 3-ethoxy propionate as casting solvent. 4,965,167, Cl. 430-191.000.

Salgado, Angel M.; and Drury, Harold L. Apparatus and method for a solar radiation water heater. 4,964,395, Cl. 126-437.000.

Salle, Bertrand, to Telecommunications Radio-electronics et Telephoniques T.R.T. Echo canceller for a variable-phase echo signal. 4,965,786, Cl. 370-32.100.

Sameshima, Yoshinobu: *See*—
Fujita, Masami; Nakanishi, Kazuhiro; and Sameshima, Yoshinobu, 4,965,615, Cl. 354-145.100.

SamSung Electronics Co., Ltd.: *See*—
Choi, Kyu H.; Lee, Jung H.; Lee, Heyung-Sub; Yoek, Tae-Yoon; and Bae, Dong-Joo, 4,965,214, Cl. 437-24.000.
Shin, Yunseung, 4,965,470, Cl. 307-446.000.

Sancaktar, Erol, to Kendall Company, The. Tapered roofing tape. 4,965,119, Cl. 428-192.000.

Sanders, Josef: *See*—
Hendricks, Udo W.; Sanders, Josef; and Tamer, Ergun, 4,964,875, Cl. 8-442.000.

Sanders, Ronald S.: *See*—
Curtis, James M.; and Sanders, Ronald S., 4,965,430, Cl. 219-121.690.

Sandia Corporation: *See*—
Land, Cecil E.; and McKinney, Ira D., 4,965,784, Cl. 369-100.000.

Sandkuehler, Peter: *See*—
Jeschke, Peter; Kiewert, Eva; Nieendick, Claus; Nuesslein, Hans; and Sandkuehler, Peter, 4,965,014, Cl. 252-174.220.

Sandoz Ltd.: *See*—
Bobrowski, Gregory S.; Guecia, Gregory C. J.; Lupyan, David A.; and Kinney, Frederick D., 4,964,917, Cl. 106-804.000.

Sandrow, Martin S. Small boat hoisting apparatus and method. 4,964,358, Cl. 114-368.000.

Sands, Robert E.; and Floren, Carl E., to Mueller Co. Method for forming a ball valve connection and structure. 4,964,614, Cl. 251-315.000.

Sandvik AB: *See*—
Hagenfeldt, Carl P. U.; and Roos, Annika M., 4,964,925, Cl. 148-325.000.

Sanfeliu, Amparo S.; Tuero, Lucia S.; Delgado de Molina Gonzalez, Maria J.; and Vinas, Antonio B., to Laboratorios Vinas, S.A. Imidazole derivatives and a process for the preparation thereof. 4,965,365, Cl. 548-109.000.

Sangyoji, Kazuo; Yamamoto, Takemi; Hatta, Naoyuki; Sakakibara, Kenji; Asano, Yuji; Hara, Yoshimasa; Matsumoto, Yumio; and Hayakawa, Kiyoharu, to Brother Kogyo Kabushiki Kaisha. Image processing apparatus for reproducing images on projector screen and photosensitive medium. 4,965,592, Cl. 346-110.00R.

Sanns, Jr. Frank, to Mobay Corporation. Polyurea elastomers with improved surface quality. 4,965,293, Cl. 521-124.000.

Sano, Shoichi; Furukawa, Yoshimi; and Hamada, Tetsuro, to Honda Giken Kogyo Kabushiki Kaisha. Steering system for vehicles. 4,964,481, Cl. 180-140.000.

Sanofi: *See*—
Descamps, Marcel; and Sayac, Georges, 4,965,401, Cl. 560-210.000.

Sanrio Company, Ltd.: *See*—
Tsuji, Shintaro, 4,965,855, Cl. 455-344.000.

Sans Pitarch, Esteve: *See*—
Cabre Castellvi, Juan; Diago Meseguer, Jose ; Esteve Bianchini, Asuncion; Lenhardt Padro, Carlos E.; and Sans Pitarch, Esteve, 4,965,358, Cl. 544-357.000.

Santoh, Tsuyoshi; and Hioki, Chieko, to Canon Kabushiki Kaisha. Optical recording medium. 4,965,178, Cl. 430-495.000.

Sanyo Denki Co., Ltd.: *See*—
Maruyama, Tsutomu; and Kobayashi, Koichi, 4,965,463, Cl. 307-87.000.

Sanyo Electric Co., Ltd.: *See*—
Tanaka, Tsutomu, 4,964,281, Cl. 62-256.000.

Saphakkul, Fongchan, to Unilever Patent Holdings B.V. Hair treatment product. 4,964,874, Cl. 8-429.000.

Sarcos Group: *See*—
Jacobsen, Stephen C.; and Wood, John E., 4,964,306, Cl. 73-763.000.

Sarin, Vinod K., to GTE Laboratories Incorporated. Composite coatings on refractory substrates. 4,965,140, Cl. 428-698.000.

Sarkisian, Nancy L.; and Martin, Stanley W., to Datatape Incorporated. Bidirectional web guiding system. 4,964,557, Cl. 226-18.000.

Sartorius AG: *See*—
Stadler, Eberhard; Eger, Matthias; Melcher, Franz-Josef; and Martens, Veronika, 4,964,478, Cl. 177-229.000.

Saruwatari, Tomozumi, to Seiko Instruments Inc. Multi-functional electronic timepiece. 4,965,779, Cl. 368-80.000.

Sasaki, Masaomi: *See*—
Hashimoto, Mitsuru; Shimada, Tomoyuki; Suzuki, Nobuo; Sakai, Takayuki; Suzuka, Susumu; and Sasaki, Masaomi, 4,965,157, Cl. 430-80.000.

Sasaki, Mitsuo: *See*—
Yamaura, Tamotsu; Yamaoka, Fumiyuki; and Sasaki, Mitsuo, 4,964,493, Cl. 188-322.150.

Sasaki, Susumu, to Fujitsu Limited. Radio transmitter-receiver system for increasing or decreasing communication channels. 4,965,852, Cl. 455-82.000.

Sasaki, Takashi, to Canon Kabushiki Kaisha. Method for measuring of chromatic optical density. 4,965,663, Cl. 358-80.000.

Sasaki, Yoshihiro: *See*—
Kawai, Mitsuru; Yoshida, Masaru; and Sasaki, Yoshihiro, 4,964,815, Cl. 439-610.000.

Sasaki, Yutaka; Mori, Kunio; and Moriya, Kiyoshi, to Nitto Chemical Industry Co., Ltd. Process for producing acrylonitrile. 4,965,393, Cl. 558-324.000.

Sasame, Akira; Sakanoue, Hitoyuki; Miyake, Masaya; and Yamakawa, Akira, to Sumitomo Electric Industries, Ltd. Member for a semiconductor structure. 4,965,659, Cl. 357-81.000.

Sasnett, Michael W.; Paitich, Ronald; and Aurich, Edward L., to Coherent, Inc. Apparatus for indicating the power and position of a laser beam. 4,964,735, Cl. 374-32.000.

Sasse, Klaus: *See*—
Kruger, Bernd W.; Sasse, Klaus; Lunkenheimer, Winfried; Hoever, Franz P.; Nentwig, Gunther; and Behrenz, Wolfgang, 4,965,286, Cl. 514-514.000.

Sasson, Yoel: *See*—
Jihad, Dakka; Amikam, Zoran; and Sasson, Yoel, 4,965,406, Cl. 562-414.000.

Sato, Hidenobu: *See*—
Maeda, Toshimasa; and Sato, Hidenobu, 4,964,371, Cl. 123-41.100.
Sato, Hiroshi: *See*—
Sakaki, Mamoru; Nakatsugawa, Tomomi; Koike, Shoji; and Sato, Hiroshi, 4,965,612, Cl. 346-1.100.
Sato, Jun, to Shimano Industrial Company Limited. Fishing reel. 4,964,590, Cl. 242-261.000.
Sato, Jun: *See*—
Matsuo, Shigeru; Katsura, Koyo; Sato, Jun; Sone, Takashi; and Yokoyama, Masakatu, 4,965,750, Cl. 364-521.000.
Sato, Katsuyuki: *See*—
Otsuka, Kanji; Kuroda, Shigeo; Sato, Katsuyuki; Nakamura, Hisashi; and Shouji, Shinichi, 4,965,653, Cl. 357-55.000.
Sato, Toshihiro: *See*—
Takagi, Tadao; Sato, Toshihiro; and Saegusa, Takashi, 4,965,620, Cl. 354-416.000.
Satoh, Tomoko: *See*—
Yanaki, Toshio; Machata, Shigeki; Satoh, Tomoko; and Ikeda, Shinji, 4,965,354, Cl. 536-124.000.
Sauerbrey, David W.: *See*—
Itameri-Kinter, Terry; Sauerbrey, David W.; and Troia, Victor, 4,964,788, Cl. 417-422.000.
Saulnier, Mark G.; and Langley, David R., to Bristol-Myers Company. Dimeric epipodophyllotoxin glucoside derivatives. 4,965,348, Cl. 536-17.200.
Saunders, William J.: *See*—
Kirschner, Jonathan; and Saunders, William J., 4,964,532, Cl. 222-1.000.
Sauter, Erich W.; Hamburg, John; and Phillips, Warren L., to Sauter Manufacturing Corp. Method and apparatus for the gelatin coating of caplets. 4,965,089, Cl. 427-3.000.
Sauter Manufacturing Corp.: *See*—
Sauter, Erich W.; Hamburg, John; and Phillips, Warren L., 4,965,089, Cl. 427-3.000.
Savage, Timothy L. Radioscopic lavatory chair and method. 4,965,818, Cl. 378-208.000.
Savio, S.p.A.: *See*—
Colli, Luigi; Badiali, Roberto; and Marangone, Nereo, 4,964,581, Cl. 242-35.60R.
Savitsky, Wallace R.; Schaffer, Ronald R.; and Warner, Gary N., to AMP Incorporated. Connector with precision fiber optic alignment clamp. 4,964,685, Cl. 350-96.200.
Sawada, Hiroshi; Ueda, Tatehito; Nakanishi, Kiyoshi; and Demura, Takayuki, to Toyota Jidosha Kabushiki Kaisha. Air-fuel ratio feedback control system including at least downstream-side air-fuel ratio sensor. 4,964,271, Cl. 60-274.000.
Sawyer, John A., to Dresser-Rand Company. Piston and connecting pin assembly, a crosshead and connecting pin assembly, and a connecting pin assembly. 4,964,332, Cl. 92-187.000.
Sayac, Georges: *See*—
Descamps, Marcel; and Sayac, Georges, 4,965,401, Cl. 560-210.000.
Sayo, Noboru: *See*—
Mikami, Koichi; Terada, Masahiro; Nakai, Takeshi; Sayo, Noboru; and Kumobayashi, Hidenori, 4,965,398, Cl. 560-60.000.
Scarnera, Michele, to Marelli Autronics S.p.A. Ignition system for an internal combustion engine. 4,964,377, Cl. 123-605.000.
Schaal, Hans: *See*—
Huttenberger, Michael; Kleineberg, Wolfgang; Schaal, Hans; Attinger, Thomas; and Dietz, Jurgen, 4,965,555, Cl. 340-624.000.
Schacht, Etienne; and Crommen, Jan, to Ethyl Corporation. Novel dibasic acid salts and their synthesis. 4,965,397, Cl. 560-60.000.
Schadt, Larry M.: *See*—
Guzzetta, Gerald J.; Hornberger, David E.; Guzzetta, Charles A.; and Schadt, Larry M., 4,964,759, Cl. 405-154.000.
Schaefer, Joachim: *See*—
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Schaefer, Wayne A.: *See*—
Gallagher, Brian J.; Schaefer, Wayne A.; and Klein, Peter P., 4,965,573, Cl. 340-968.000.
Schaefer, William L., to PPG Industries, Inc. Programmably controlled fiber glass strand feeders and improved methods for making glass fiber mats. 4,964,891, Cl. 65-4.400.
Schaeffer, Norbert: *See*—
Hoffrichter, Bernd; Pavelka, Bozidar; Pfefferkorn, Dietmar; Schaeffer, Norbert; and Goetz, Klaus, 4,964,588, Cl. 242-199.000.
Schaffer, Ronald R.: *See*—
Savitsky, Wallace R.; Schaffer, Ronald R.; and Warner, Gary N., 4,964,685, Cl. 350-96.200.
Schaper, Ulrich: *See*—
Von Basse, Paul-Werner; Dortu, Jean-Marc; Herlitzek, Andrea; Kohlert, Dieter; and Schaper, Ulrich, 4,965,464, Cl. 307-270.000.
Scheffel, Gary W.: *See*—
Gausman, Theodore J.; and Scheffel, Gary W., 4,964,423, Cl. 137-543.170.
Scheiber, John G. Fluid dispenser. 4,964,543, Cl. 222-180.000.
Scheinpflug, Hans: *See*—
Anderson, John; Homeyer, Bernhard; Kuhle, Engelbert; Scheinpflug, Hans; Zeck, Walter M.; and Simonet, Donald E., 4,965,254, Cl. 514-89.000.
Scheithauer, Richard A.: *See*—
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Schelschahorn, Herbert: *See*—
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Schenker, Gilbert: *See*—
Schmid, Karl-Heinz; Meffert, Alfred; Schenker, Gilbert; Asbeck, Adolf; and Geke, Juergen, 4,965,019, Cl. 252-321.000.
Schepers, Charles; and Schroder, Wolfgang, to Nokia Unterhaltungselektronik. Interactive control of entertainment electronics apparatus. 4,965,557, Cl. 340-711.000.
Schering Aktiengesellschaft: *See*—
Gais, Hans-Joachim; Erdelmeier, Irene; and Birk, Rolf, 4,964,846, Cl. 549-336.000.
Schermanz, Karl; Saischek, Gerald; Kores, Dietmar; Graf, Josef; Haas, Gerhard; and Martetschlager, Kurt, to CL Pharma Aktiengesellschaft. Allylaminoethylazoles. 4,965,277, Cl. 514-385.000.
Scherping Systems, Inc.: *See*—
Jay, Jeffrey L., 4,964,334, Cl. 99-459.000.
Schertz, Charles W.: *See*—
Bastian, Thomas W.; and Schertz, Charles W., 4,964,339, Cl. 102-376.000.
Schickler, Edward R.: *See*—
Lioy, Daniel C.; Hurtubis, Edward F.; and Schickler, Edward R., 4,964,203, Cl. 29-121.800.
Schilowitz, Alan M.; Shaub, Harold; Berlowitz, Paul J.; Homan, Howard S.; and Wigg, Eric E., to Exxon Research & Engineering Company. Distillate fuels containing mono alkyl substituted derivatives of thiadiazoles. 4,964,880, Cl. 44-341.000.
Schiltz, John R.; and Nabial, Wanda, to American Cyanamid Company. Radioactive assay for measuring water absorption by humectants. 4,965,450, Cl. 250-303.000.
Schlager, Harald: *See*—
Normann, Norbert; Gross, Erwin; and Schlager, Harald, 4,965,689, Cl. 360-131.000.
Schlak, Ottfried: *See*—
Schwabe, Peter; Schlak, Ottfried; Knispel, Gottfried; and Voigt, Reiner, 4,965,295, Cl. 523-109.000.
Schleicher, Ulrich, to Diehl GmbH & Co. Propulsion mechanism for a subcaliber projectile. 4,964,342, Cl. 102-521.000.
Schleyerbach, Rudolf: *See*—
Bartlett, Robert R.; Schleyerbach, Rudolf; and Kammerer, Friedrich-Johannes, 4,965,276, Cl. 514-378.000.
Schlicht, Raymond C., to Texaco Inc. Borated detergent additive by an improved process. 4,965,003, Cl. 252-38.000.
Schlicht, Raymond C.; and Powers, William J., III, to Texaco Inc. Process for a borated detergent additive. 4,965,004, Cl. 252-38.000.
Schloemer, Jerry R. System for and method of assigning frequencies in a communications system with no central control of frequency allocation. 4,965,850, Cl. 455-33.000.
Schlottke, Karl-Heinz, to E.C.H. Will GmbH. Apparatus for stacking paper webs in zig-zag formations. 4,964,626, Cl. 270-39.000.
Schlumberger Industries: *See*—
Mosser, Vincent; and Robert, Jean-Louis, 4,965,697, Cl. 361-283.000.
Schlumberger Technologies, Inc.: *See*—
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Schlumberger Technology Corporation: *See*—
Hazen, Gary A.; and Macune, Don T., 4,965,522, Cl. 324-339.000.
Schlunt, Richard S., to General Dynamics Corporation, Pomona Div. Fast discrete fourier transform apparatus and method. 4,965,761, Cl. 364-726.000.
Schmatz, Duane J., to Ford Motor Company. Molybdenum-platinum-oxide electrodes for thermoelectric generators. 4,965,142, Cl. 429-11.000.
Schmerler, Joseph. Transfer aid with auxiliary support system. 4,964,182, Cl. 5-81.00R.
Schmid, Erich, to Siemens Aktiengesellschaft. Hearing aid housing with retaining frame. 4,965,831, Cl. 381-69.000.
Schmid, Karl-Heinz; Meffert, Alfred; Schenker, Gilbert; Asbeck, Adolf; and Geke, Juergen, to Henkel Kommanditgesellschaft auf Aktien. Use of selected end-group closed fatty alcohol ethoxylates for low-foam, cold-sprayable cleaning agents. 4,965,019, Cl. 252-321.000.
Schmid, Konrad: *See*—
Frey, Christian; Dill, Bernd; and Schmid, Konrad, 4,964,876, Cl. 8-643.000.
Schmid, Renacu/e/ ; and Koller, Jurg, to Maschinenfabrik Rieter AG. Cleaning machine for textile fibres with means for removing dust. 4,964,196, Cl. 19-200.000.
Schmidt, Deborah D.; Alter, Wendy S.; and Hamilton, William D., to United States of America, National Aeronautics and Space Administration. Directional solidification of superalloys. 4,964,453, Cl. 164-122.100.
Schmidt, Jerold B.: *See*—
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Schmidt, Josef: *See*—
Christine, William C.; Lyons, Steffen; Posey, John; Schmidt, Josef; and Herschman, George J., 4,964,944, Cl. 156-515.000.
Schmidt, Oskar. Pneumatic tire. 4,964,451, Cl. 152-202.000.
Schmidt, Reinhold. Anti-theft apparatus including a screw with an anti-theft safety head. 4,964,773, Cl. 411-373.000.
Schmitten, Phillip F.: *See*—
Blankenship, William P.; Ritter, Robert; and Schmitten, Phillip F., 4,964,277, Cl. 62-3.200.
Schneider, Hans-Dieter, to Ciba-Geigy Corporation. Hydroxamic acid esters. 4,965,390, Cl. 558-7.000.
Schneider, Ortwin, to Erweka Apparatebau GmbH. Disintegration testing device. 4,964,310, Cl. 73-866.000.

Schneider, Rudolf; Muller, Jurgen; and Voigtlander, Volkmar, to AGFA-Gevaert AG. X-ray imaging film and apparatus for handling it. 4,965,455, Cl. 250-484.100.

Schnetzka, Harold R., II: *See*—
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Schoenwald, Siegfried; Breyer, Eberhard; and Trojahn, Hans-Georg, to Siemens Aktiengesellschaft. Pump assembly. 4,964,785, Cl. 417-360.000.

Schoeppe, H. Jay, II: *See*—
De Maat, H. Thomas; and Schoeppe, H. Jay, II, 4,964,231, Cl. 40-152.000.

Schofield, Paul J.; and Goheen, Leo A., to Truswall Systems Corporation. Apparatus and method for selecting and positioning truss connector plates. 4,965,740, Cl. 364-512.000.

Schrader, Karl-Heinz: *See*—
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Schrauth, Peter A.: *See*—
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Schroder, Wolfgang: *See*—
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Schubert, Jurgen: *See*—
Poppe, Ulrich; Schubert, Jurgen; and Evers, Wilhelm, 4,965,248, Cl. 505-1.000.

Schueler, Hans; Lauterbach, Heinz; Tschoeke, Helmut; Kinzel, Richard; and Stipek, Theodor, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,964,789, Cl. 417-494.000.

Schuetz, James E., to Dow Chemical Company, The. Method of preparing an aqueous inorganic powder slurry which is extruded and dried to form an inorganic article. 4,965,039, Cl. 264-553.000.

Schulte-Schlagbaum Aktiengesellschaft: *See*—
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Schulte Strathaus, Franz-Erich: *See*—
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Schultz, David A. Raised panel cutter assembly. 4,964,448, Cl. 144-223.000.

Schultz, Donald W.: *See*—
Braine, Mark D.; Kirby, Ralph; Schultz, Donald W.; Tuttle, Richard G.; Ferg, Nelson M.; Hickman, John B.; and Webb, William C., 4,964,248, Cl. 52-60.000.

Schumacher, Larry L., to United States of America, National Aeronautics and Space Administration. Remote object configuration/orientation determination. 4,964,722, Cl. 356-152.000.

Schwab, Joachim: *See*—
Maier, Manfred; Ruppert, Franz; and Schwab, Joachim, 4,964,299, Cl. 73-146.000.

Schwab, Kerstein. Two piece torso display device for stockings. 4,964,549, Cl. 223-66.000.

Schwabe, Peter; Schlak, Ottfried; Knispel, Gottfried; and Voigt, Reiner, to Bayer Aktiengesellschaft. Dimensionally stable impression compositions. 4,965,295, Cl. 523-109.000.

Schwendner, Susan W.: *See*—
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Scientific Atlanta: *See*—
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Scientific-Atlanta, Inc.: *See*—
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Scot, Inc.: *See*—
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Scott, James C., to Sundstrand Corporation. Automatic regulation of balancing pressure in a screw compressor. 4,964,790, Cl. 418-1.000.

Scott, Paul F.: *See*—
Baker, Russ J.; Hansen, Robert A.; Scott, Paul F.; and Vozenilek, Edward F., 4,965,523, Cl. 324-672.000.

Scovell, Peter D.; Blomley, Peter F.; and Baker, Roger L., to STC PLC. Method of fabricating a bi-CMOS device. 4,965,216, Cl. 437-31.000.

Seaborne, Jonathan, to General Mills, Inc. Amphoteric ceramic microwave heating susceptor compositions. 4,965,423, Cl. 219-10.55E.

Seaborne, Jonathan, to General Mills, Inc. Amphoteric ceramic microwave heating susceptor compositions with metal salt moderators. 4,965,427, Cl. 219-10.55E.

Seaquist Closures: *See*—
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Seatt Corporation: *See*—
Brodecki, James; Tanguay, William; and Fiene, Dale, 4,965,556, Cl. 340-628.000.

Security Tag Systems, Inc.: *See*—
Menyhert, William R., 4,964,951, Cl. 162-140.000.

Sedgewick, Judy E.: *See*—
Freytsis, Avrum; and Sedgewick, Judy E., 4,965,862, Cl. 250-453.100.

Seener, G. Thomas: *See*—
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Segawa, Tadanori: *See*—
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Seiko Instruments Inc.: *See*—
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Seiler, Erhard: *See*—
Taubitz, Christof; Seiler, Erhard; Hambrecht, Juergen; Mitulla, Konrad; and Reimann, Horst, 4,965,318, Cl. 525-179.000.

Seita, Yukio; and Emi, Makoto, to Terumo Corporation. Flat permeable membrane and for manufacture thereof. 4,964,991, Cl. 210-500.360.

Seita, Yukio: *See*—
Kitoh, Hideaki; Seita, Yukio; Koyama, Noriyuki; and Yokomachi, Shinsuke, 4,965,291, Cl. 521-64.000.

Seki, Mitsuhiro, to Somar Corporation. Thin film adhering method and thin film adhering apparatus. 4,964,937, Cl. 156-250.000.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Inai, Toshimi; and Motoi, Koji, 4,965,102, Cl. 427-374.400.

Seko, Kiyoshi; Hatano, Masato; and Suzuki, Shigeki, to Fuji Machinery Company Ltd. Packaging article inclusion-proofing device for end-sealing mechanism. 4,964,258, Cl. 53-75.000.

Semiconductor Energy Laboratory Co., Ltd.: *See*—
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Sencorp: *See*—
Crutcher, John P.; Hueil, J. Charles; and Juska, Donald D., 4,964,558, Cl. 227-8.000.

Seon, Francoise: *See*—
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Seregelyi, Elza V.: *See*—
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Seuter, Friedel: *See*—
Boshagen, Horst; Rosentreter, Ulrich; Lieb, Folker; Oediger, Hermann; Seuter, Friedel; Perzborn, Elisabeth; and Fiedler, Volker-Bernd, 4,965,258, Cl. 514-158.000.

Severin, Jan W.: *See*—
De With, Gijsbertus; and Severin, Jan W., 4,965,249, Cl. 505-1.000.

SGS Microelettronica SpA: *See*—
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SGS-Thomson Microelectronics s.r.l.: *See*—
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Shah, Indravadan J.: *See*—
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Shanzer, Abraham: *See*—
Sagiv, Jacob; Rubinstein, Israel; Steinberg, Suzi; Shanzer, Abraham; and Tor, Yitzhak, 4,964,972, Cl. 204-418.000.

Sharma, Brij N.: *See*—
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Sharma, Pramod K.; Voecks, Gerald E.; and Gavalas, George R., to California Institute of Technology, The. Calcium impregnation of coal enriched in CO_2 using high-pressure techniques. 4,964,881, Cl. 44-620.000.

Sharp Kabushiki Kaisha: *See*—
Ibuchi, Yoshiaki, 4,965,622, Cl. 355-27.000.
Kurokawa, Makoto; Shimoda, Yoshihide; and Tsuchimoto, Shuhei, 4,964,366, Cl. 118-429.000.
Suzuki, Minoru; Minefuji, Nobutaka; and Fujimoto, Osamu, 4,964,696, Cl. 350-315.000.
Yoshida, Shinichi, 4,965,715, Cl. 364-200.000.
Yoshimura, Hisashi, 4,965,595, Cl. 346-140.00R.

Sharpe, Robin; Hart, Peter; and Van de Mortel, Petrus P., to U.S. Philips Corporation. Cellular telephone apparatus. 4,965,820, Cl. 379-59.000.

Sharpless, K. Barry: *See*—
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Shaub, Harold: *See*—
Schilowitz, Alan M.; Shaub, Harold; Berlowitz, Paul J.; Homan, Howard S.; and Wigg, Eric E., 4,964,880, Cl. 44-341.000.

Shaukatullah, Hussain: *See*—
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Shaw, Henry: *See*—
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Shaw, James E.; and Roberts, John S., to Phillips Petroleum Company. Purification of high boiling alkyl sulfides. 4,964,957, Cl. 203-6.000.

Shaw, Richard G.; and Su, Tien-Kuei, to Mobil Oil Corporation. Blends and films of linear ethylene polymers with polyurethane and method of their extrusion. 4,965,034, Cl. 264-211.000.

Shelffo, Loren: *See*—
Beck, Donald R.; Shelffo, Loren; and Ontawar, Susan P., 4,964,910, Cl. 106-21.000.

Shell Oil Company: *See*—
Barton, Roger E. C.; Van Breen, Adriaan W.; and Klei, Ebel, 4,965,104, Cl. 428-34.100.
Jackson, Roy J.; and Pigneri, Anthony M., 4,965,331, Cl. 526-262.000.
Van Doorn, Johannes A.; and Drent, Eit, 4,965,341, Cl. 528-392.000.

Shelton, Randolph A.; and Weber, Robert E., to Siemens-Bendix Automotive Electronics L.P. Flux concentrator for magnetic sensors. 4,965,517, Cl. 324-174.000.

Shepherd, Lloyd: *See*—
Blitchington, Frank H.; Chandross, Edwin A.; and Shepherd, Lloyd, 4,965,208, Cl. 436-5.000.

Sheppard, Clyde H.: *See*—
Lubowitz, Hyman R.; and Sheppard, Clyde H., 4,965,336, Cl. 528-170.000.
Sherman, Michael L., to Kamyr, Inc. Leaching vessel and slurry flow control. 4,964,622, Cl. 266-168.000.
Sherman, Steven K., to Digital Equipment Corporation. Aiding the design of an operation having timing interactions by operating a computer system. 4,965,758, Cl. 364-578.000.
Sherrington, David C.; and Small, Philip W., to Unilever Patent Holdings B.V. Substrate and process for making a substrate. 4,965,289, Cl. 521-53.000.
Sherwood, Walter B.: *See*—
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Shiba, Haruo: *See*—
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Shibata, Kouichi: *See*—
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Shibata, Tsuneo: *See*—
Nomura, Shoichi; Kitagawa, Akira; Kawanishi, Hidekata; and Shibata, Tsuneo, 4,965,434, Cl. 392-407.000.
Shibuya, Kiyoshi: *See*—
Yukumoto, Masao; Shibuya, Kiyoshi; Morito, Nobuyuki; and Hiramatsu, Teruo, 4,964,583, Cl. 242-56.00R.
Shiflet, Gary J.; Poon, S. Joseph; and He, Yi, to University of Virginia Alumini Patents. Aluminum-based metallic glass alloys. 4,964,927, Cl. 148-403.000.
Shih, Liang; and Skillings, Clifford L., to Eastman Kodak Company. Digital logic circuit for incremental encoders. 4,965,816, Cl. 377-17.000.
Shikauni, Masao; Nagata, Toru; Washisu, Koichi; and Sumio, Hiroshi, to Canon Kabushiki Kisha. Image stabilizing device. 4,965,619, Cl. 354-410.000.
Shima Trading Co., Ltd.: *See*—
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Shimada, Tomoyuki: *See*—
Hashimoto, Mitsuru; Shimada, Tomoyuki; Suzuki, Nobuo; Sakai, Takayuki; Suzuka, Susumu; and Sasaki, Masaomi, 4,965,157, Cl. 430-80.000.
Shimamune, Takayuki; and Hososuma, Masashi, to Permelec Electrode Ltd. Calcium phosphate-coated composite material and process for production thereof. 4,965,088, Cl. 427-2.000.
Shimamura, Kazuhiro: *See*—
Ohigashi, Chiaki; Iemura, Shigeru; Shimamura, Kazuhiro; and Tanaka, Tetsuo, 4,965,597, Cl. 346-157.000.
Shimamura, Yasuki; and Ihata, Jyoji, to Asahi Kasei Kogyo Kabushiki Kaisha. Photosensitive and heat-sensitive polymers, process for producing the same and process for recording information using the same. 4,965,322, Cl. 525-332.600.
Shimano Industrial Company Limited: *See*—
Sato, Jun, 4,964,590, Cl. 242-261.000.
Shimasue, Masanori: *See*—
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Shimatani, Shunichi; Yamamoto, Michiharu; Shimazu, Akira; and Iwama, Akio, to Nitto Denko Corporation. Process for separating methane using permeable membrane. 4,964,887, Cl. 55-16.000.
Shimazu, Akira: *See*—
Shimatani, Shunichi; Yamamoto, Michiharu; Shimazu, Akira; and Iwama, Akio, 4,964,887, Cl. 55-16.000.
Shimizu, Hiroshi: *See*—
Yoshida, Norio; and Shimizu, Hiroshi, 4,965,814, Cl. 375-111.000.
Shimoda, Kouzou: *See*—
Shukunobe, Yukitaka; Nakamura, Tetsuo; Yoshida, Tomoe; Doki, Ryoichi; Kuwazuru, Mamoru; and Shimoda, Kouzou, 4,965,051, Cl. 422-145.000.
Shimoda, Yoshihide: *See*—
Kurokawa, Makoto; Shimoda, Yoshihide; and Tsuchimoto, Shuhei, 4,964,366, Cl. 118-429.000.
Shimomichi, Tsuyoshi: *See*—
Oohashi, Keiji; Suzuki, Hideo; Araki, Shinji; and Shimomichi, Tsuyoshi, 4,964,694, Cl. 350-96.330.
Shin-Etsu Chemical Co., Ltd.: *See*—
Inouye, Yoshio; Inoue, Takeo; and Yokoo, Koji, 4,965,333, Cl. 528-33.000.
Onda, Yoshiro; and Tanioka, Soji, 4,965,313, Cl. 525-59.000.
Shinohara, Toshio; and Hayashi, Masatoshi, 4,965,387, Cl. 556-440.000.
Shin, Yunseung, to Samsung Electronics Co., Ltd. High integrated Bi-CMOS logic circuit. 4,965,470, Cl. 307-446.000.
Shinagawa, Tohru, to Hitachi Maxell, Ltd. Memory arrangement utilized for IC card. 4,965,802, Cl. 371-51.100.
Shindo, Tokuhiko: *See*—
Uno, Hitoshi; Kon, Tatsuya; Nishikawa, Yoshinori; Shindo, Tokuhiko; Nakamura, Hideo; and Ishii, Katsumi, 4,965,266, Cl. 514-253.000.
Shinno, Yoshio; and Nakade, Yasuhiko, to Kubota Ltd. Water-cooled type internal combustion engine for farming motor vehicle. 4,964,383, Cl. 123-195.00C.
Shinohara, Hayato; and Tsukada, Isao, to Canon Kabushiki Kaisha. Driving method for ink jet head. 4,965,608, Cl. 346-1.100.
Shinohara, Hisato, to Semiconductor Energy Laboratory Co., Ltd. Optical system for use of a laser processing machine. 4,964,704, Cl. 350-433.000.
Shinohara, Toshio; and Hayashi, Masatoshi, to Shin-Etsu Chemical Co., Ltd. Triorganosilylmethyl esters of α-trifluoromethylacrylic acid. 4,965,387, Cl. 556-440.000.
Shinwa Sangyo Company, Ltd.: *See*—
Komiya, Jujiro; and Muto, Tadanobu, 4,964,977, Cl. 261-130.000.
Shiota, Kazuo, to Fuji Photo Film Co., Ltd. Video printer for making video image hard copies. 4,965,662, Cl. 358-78.000.
Shirai, Shoji; Yamauchi, Masaaki; and Tanaka, Yasuo, to Hitachi, Ltd.; and Hitachi Device Engineering Co., Ltd. Electron gun for cathode-ray tube. 4,965,489, Cl. 313-449.000.
Shiraishi, Shuhei; and Hakiri, Minoru, to Ricoh Company, Ltd. Thermal image transfer recording medium. 4,965,124, Cl. 428-327.000.
Shirasu, Kazuhiro: *See*—
Ukai, Toshinao; Shirasu, Kazuhiro; Nakamura, Koki; Koya, Keizo; Okada, Masahiro; and Katoh, Kazunobu, 4,965,170, Cl. 430-264.000.
Shizaki, Tomoo; Kawaguchi, Yoshiyuki; Nakano, Yasuhiko; Gotoda, Yusuke; and Takemura, Hiroo, to Honda Giken Kogyo Kabushiki Kaisha. Fuel injection features of a two-cycle engine for motorcycles. 4,964,381, Cl. 123-73.00A.
Shmilowitz, Shaul: *See*—
Georlette, Pierre; Goren, Hanoch; Shmilowitz, Shaul; and Teuerstein, Avraham, 4,965,021, Cl. 252-609.000.
Shmulovich, Joseph: *See*—
Fratello, Vincent J.; Rabinovich, Eliezer M.; and Shmulovich, Joseph, 4,965,091, Cl. 427-64.000.
Shoens, Kurt A.; and Treiber, Richard K., to International Business Machines Corporation. Method for lock management, page coherency, and asynchronous writing of changed pages to shared external store in a distributed computing system. 4,965,719, Cl. 364-200.000.
Shomo, Douglas A. Cargo stabilizing device. 4,964,768, Cl. 410-94.000.
Shouji, Shinichi: *See*—
Otsuka, Kanji; Kuroda, Shigeo; Sato, Katsuyuki; Nakamura, Hisashi; and Shouji, Shinichi, 4,965,653, Cl. 357-55.000.
Showa Denko Kabushiki Kaisha: *See*—
Ishiwatari, Kiyokazu; Hamada, Yoshitsugu; and Yamada, Osamu, 4,965,035, Cl. 264-268.000.
Shramek, James F.: *See*—
Morris, Scott S.; Shramek, James F.; and Owsley, David P., 4,965,613, Cl. 346-25.000.
Shu, Paul, to Mobil Oil Corporation. Programmed gelation of polymers using melamine resins. 4,964,461, Cl. 166-252.000.
Shu, Paul, to Mobil Oil Corporation. Crosslinked polyvinyl amine copolymer gels for use under harsh reservoir conditions. 4,964,463, Cl. 166-270.000.
Shukunobe, Yukitaka; Nakamura, Tetsuo; Yoshida, Tomoe; Doki, Ryoichi; Kuwazuru, Mamoru; and Shimoda, Kouzou, to R&D Association for Bioreactor System. Reactor provided with fluidized chamber. 4,965,051, Cl. 422-145.000.
Shyu, Jieh-Hwa: *See*—
Nelsen, Barry F.; and Shyu, Jieh-Hwa, 4,964,959, Cl. 204-15.000.
Shyu, Keh-Hwa: *See*—
Jeng, Bor-Shenn; Chang, Gan-How; Chang, Kuang-Yao; Liu, Jsann-Shyong; Lin, Jangkeng; Hwang, Jei-Shoung; Wu, T-Min; Shyu, Keh-Hwa; Miou, Char-Hin; and Can, Luke, 4,965,458, Cl. 364-419.000.
Sibuet, Henri: *See*—
Deroux-Dauphin, Patrice; Sibuet, Henri; and Dupeux, Thierry, 4,964,312, Cl. 29-852.000.
Sickles, Willard J.: *See*—
Kolvites, Albert; Cohn, Robert J.; Welsch, John H.; Sickles, Willard J.; and Balazek, David T., 4,964,350, Cl. 108-110.000.
Siede, Reinhard; Hoppner, Klaus; Weiss, Hermann; and Weissert, Wolfgang, to Andreas Stihl. Handle for a chain saw. 4,964,217, Cl. 30-383.000.
Siemens Aktiegesellschaft: *See*—
Auracher, Franz; Ebberg, Alfred; Noll, Bernd; Meissner, Eckhard; and Rodler, Hermann-Johann, 4,965,857, Cl. 455-618.000.
Siemens Aktiengesellschaft: *See*—
Ahne, Hellmut; and Hammerschmidt, Albert, 4,965,134, Cl. 428-411.100.
Huettenrauch, Gerd; and Schelschshorn, Herbert, 4,965,456, Cl. 250-515.100.
Kriedt, Hans; Dietze, Andreas; and Fenk, Josef, 4,965,510, Cl. 323-315.000.
Kumpfmueller, Hans-Georg; and Schaefer, Joachim, 4,965,696, Cl. 361-160.000.
Schmid, Erich, 4,965,831, Cl. 381-69.000.
Schoenwald, Siegfried; Breyer, Eberhard; and Trojahn, Hans-Georg, 4,964,785, Cl. 417-360.000.
Von Basse, Paul-Werner; Dortu, Jean-Marc; Herlitzek, Andrea; Kohlert, Dieter; and Schaper, Ulrich, 4,965,464, Cl. 307-270.000.
Siemens-Bendix Automotive Electronics L.P.: *See*—
Shelton, Randolph A.; and Weber, Robert E., 4,965,517, Cl. 324-174.000.
Siemens Transmission Systems, Inc.: *See*—
Burns, Robert V.; and Gupta, Sanjay, 4,965,692, Cl. 361-18.000.
Siemon Company, The: *See*—
Siemon, John A.; and Reed, Brian, 4,964,812, Cl. 439-403.000.
Siemon, John A.; and Reed, Brian, to Siemon Company, The. Wire termination block. 4,964,812, Cl. 439-403.000.
Siguad, Jean-Bernard: *See*—
Mauleon, Jean-Louis; Siguad, Jean-Bernard; Pontier, Renaud; and Hoffmann, Frederic, 4,965,232, Cl. 502-43.000.

Sihver, Jaak J.: *See*—
Heyland, Sven; Rolli, Karl; Roschli, David; and Sihver, Jaak J., 4,965,085, Cl. 426-533.000.

Silbering, Steven B.; Blythe, Rowland P., Jr.; Nesbitt, Russell U., Jr.; and Fawzi, Mahdi B., to Warner-Lambert Company. Purified thrombin preparations. 4,965,203, Cl. 435-188.000.

Silent Sound Systems, Inc.: *See*—
De Maat, H. Thomas; and Schoeppe, H. Jay, II, 4,964,231, Cl. 40-152.000.

Simens Aktiengesellschaft: *See*—
Chyla, Thomas; and Meinherz, Manfred, 4,965,419, Cl. 200-147.00R.

Simgen, Helmut: *See*—
Wieland, Gerhard; Steckenreuter, Klaus; Gernand, Wolfgang; and Simgen, Helmut, 4,964,521, Cl. 215-32.000.

Simmonds Precision Products, Inc.: *See*—
Weitz, Paul G., Jr., 4,965,731, Cl. 364-442.000.

Simon, Jean-Michel: *See*—
Ciolczyk, Jean-Pierre; and Simon, Jean-Michel, 4,964,624, Cl. 267-81.000.

Simoncelli, M. Philippe: *See*—
Prevot, M. Gerard; Aumercier, M. Laurent; and Simoncelli, M. Philippe, 4,964,660, Cl. 292-37.000.

Simonet, Donald E.: *See*—
Anderson, John; Homeyer, Bernhard; Kuhle, Engelbert; Scheinpflug, Hans; Zeck, Walter M.; and Simonet, Donald E., 4,965,254, Cl. 514-89.000.

Simonsen, Christian: *See*—
Levinson, Arthur D.; and Simonsen, Christian, 4,965,196, Cl. 435-691.000.

Singer, Arnold H.: *See*—
Nordquist, Paul E. R., Jr.; and Singer, Arnold H., 4,965,055, Cl. 423-492.000.

Singer, S. Fred: *See*—
Kinard, William H.; Singer, S. Fred; Wortman, Jim J.; Humes, Donald H.; Kassel, Philip C., Jr.; and Stanley, John E., deceased, 4,964,300, Cl. 73-170.00R.

Sinskey, Anthony J.: *See*—
Liebl, Wolfgang; and Sinskey, Anthony J., 4,965,197, Cl. 435-69.800.

Siol, Werner; and Terbrack, Ulrich, to Rohm GmbH Chemische Fabrik. Compatible polymers, and use of same for registering optically readable information. 4,965,783, Cl. 369-100.000.

Sisson, Patricia A.: *See*—
Lillig, John E.; Whelan, Michael J.; Cheon, Thomas V.; Sisson, Patricia A.; and Flores, Orlando, 4,965,049, Cl. 422-68.100.

Sitma, S.p.A.: *See*—
Ballestrazzi, Aris; and Tassi, Lamberto, 4,964,263, Cl. 53-555.000.

Siy, Pepe: *See*—
Liu, Gang; Huang, Hanchi; Siy, Pepe; and Polis, Michael P., 4,965,579, Cl. 341-159.000.

Skeirik, Richard D., to Du Pont de Nemours, E. I., and Company. Process control system with on-line reconfigurable modules. 4,965,742, Cl. 364-513.000.

SKF Industrial Trading and Development Co. B.V.: *See*—
Kapaan, Hendrikus J., 4,964,840, Cl. 464-125.000.

Skillings, Clifford L.: *See*—
Shih, Liang; and Skillings, Clifford L., 4,965,816, Cl. 377-17.000.

Skudera, William J., Jr.; and Albert, Stuart D., to United States of America, Army. Real-time rejection circuit to automatically reject multiple interfering hopping signals while passing a lower level desired signal. 4,965,581, Cl. 342-19.000.

Skvarce, Dennis: *See*—
Nolan, John H.; and Skvarce, Dennis, 4,964,327, Cl. 83-698.000.
Nolan, John H.; and Skvarce, Dennis, 4,964,328, Cl. 83-698.000.

Small, Philip W.: *See*—
Sherrington, David C.; and Small, Philip W., 4,965,289, Cl. 521-53.000.

Smart, David C.; and Baxter, Dennis E., to Eastman Kodak Company. Camera for use with film cassette having film-exposure status indicator. 4,965,600, Cl. 354-212.000.

Smilanich, Nicholas J.; and Sphar, Robert A., to Eveready Battery Company, Inc. Battery charger for detecting the current rate of charge for rechargeable batteries. 4,965,507, Cl. 320-48.000.

Smith, Dell W., to Bar-Master International. Frozen beverage dispenser. 4,964,542, Cl. 222-146.600.

Smith, Donald P.; Plumb, William W.; and High, Jarald E., to Smith, Donald P. Forced convection tunnel oven. 4,965,435, Cl. 219-388.000.

Smith, Ian H.: *See*—
Casida, John E.; Palmer, Christopher J.; Larkin, John P.; and Smith, Ian H., 4,965,257, Cl. 514-149.000.

Smith, James D. B., to Westinghouse Electric Corp. High-temperature expanding organo-phosphorus monomer/polymers. 4,965,335, Cl. 528-108.000.

Smith, James I.: *See*—
Kelaita, Joseph B., Jr.; Arnold, David; and Smith, James I., 4,965,544, Cl. 335-202.000.

Smith, Lawrence E.: *See*—
Wilber, James A.; and Smith, Lawrence E., 4,965,495, Cl. 315-371.000.

Smith-Lewis, Margaret J.: *See*—
Warren, Harold C., III; Norkus, Norbert S.; and Smith-Lewis, Margaret J., 4,965,191, Cl. 435-7.000.

Smith, Michael D., to Dallas Semiconductor Corporation. Telecommunications FIFO. 4,965,794, Cl. 370-105.100.

Smith, Michael L. Tubing collar position sensing apparatus, and associated methods, for use with a snubbing unit. 4,964,462, Cl. 166-255.000.

Smith, Michael P., to Amoco Corporation. Isotope analysis of closely adjacent minerals. 4,965,209, Cl. 436-32.000.

Smith & Nephew Dyonics, Inc.: *See*—
Prescott, Rochelle, 4,964,692, Cl. 350-96.240.

Smith, Robert A.: *See*—
Ruble, Frank D.; Stearman, Roger R.; and Smith, Robert A., 4,964,242, Cl. 51-144.000.

Smith, Scott W.: *See*—
Holtey, Thomas O.; Murray, Thomas L., Jr.; Perzan, Wayne A.; and Smith, Scott W., 4,965,721, Cl. 364-200.000.

Smith, Wayne D. Device for broadcasting dry material by explosive force. 4,964,469, Cl. 169-28.000.

Smith, Wilbur C.: *See*—
Besic, Dragan; and Smith, Wilbur C., 4,965,042, Cl. 417-437.000.

Smothers, William K.: *See*—
Keys, Dalen E.; Smothers, William K.; and Trout, Torence J., 4,965,152, Cl. 430-1.000.

SMS Engineering, Inc.: *See*—
Pavlick, Drew C., 4,964,324, Cl. 83-302.000.

Snap-on Tools Corporation: *See*—
Wisneski, Leonard J., Jr.; and Lindhard, Gordon, 4,965,494, Cl. 315-241.00S.

Snelgrove, R. Vernon: *See*—
McCullough, Francis P., Jr.; Cipriano, Robert A.; and Snelgrove, R. Vernon, 4,965,146, Cl. 429-102.000.

Soan, Basil, to APV UK Limited. Power supply circuit having controllable thyristor network and adjustable voltage regulator. 4,965,508, Cl. 323-239.000.

Sobotka, Edward W., Jr.; and Piraino, Martin P., Jr., to Cooper Industries, Inc. Circuit breaker and reset mechanisms operated through the body. 4,965,414, Cl. 200-50.00A.

Societe Anonyme dite: Alcatel Espace: *See*—
Lenormand, Regis; Billand, Marcel; Fraise, Pierre; Goupil, Jean-Claude; Raguenet, Gerard; and Rene, Didier, 4,965,587, Cl. 342-372.000.
Lenormand, Regis; Clerino, Antoine; Neron, Jacques; Marre, Jean-Philippe; and Raguenet, Gerard, 4,965,588, Cl. 342-372.000.

Societe Anonyme dite: CIPEL: *See*—
Mas, Jean-Claude; and Mendiboure, Andre, 4,965,147, Cl. 429-136.000.

Societe Anonyme dite : Les Cables de Lyon: *See*—
Bruneval, Gilles, 4,965,411, Cl. 174-89.000.

Soeda, Koji: *See*—
Katayama, Hideaki; Murakami, Toshifumi; Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; and Ijiri, Masaaki, 4,964,792, Cl. 425-32.000.

Sokira, Thomas J.: *See*—
Bauer, George W.; and Sokira, Thomas J., 4,965,738, Cl. 364-483.000.

Solarek, Daniel B.; Dirscherl, Teresa A.; Hernandez, Henry R.; and Jarowenko, Wadym, to National Starch and Chemical Investment Holding Corporation. Amphoteric starches and process for their preparation. 4,964,953, Cl. 162-175.000.

Solitron Devices, Inc.: *See*—
Mickey, Joseph J., III, 4,965,538, Cl. 333-81.00A.

Solomon, Paul M., to International Business Machines Corp. Saturable charge FET. 4,965,645, Cl. 357-22.000.

Soltech, Inc.: *See*—
Nelson, Thomas E., 4,964,250, Cl. 52-144.000.

Solter, Hans-Joachim. Method and apparatus for the contactless testing of the surface and inner structure of a solid workpiece. 4,965,451, Cl. 250-330.000.

Somar Corporation: *See*—
Seki, Mitsuhiro, 4,964,937, Cl. 156-250.000.

Sone, Takashi: *See*—
Matsuo, Shigeru; Katsura, Koyo; Sato, Jun; Sone, Takashi; and Yokoyama, Masakatu, 4,965,750, Cl. 364-521.000.

Sone, Yoshiaki: *See*—
Misaki, Akira; Sone, Yoshiaki; Mitsuhashi, Masakazu; and Miyake, Toshio, 4,965,347, Cl. 536-1.100.

Sonoda, Hirofumi: *See*—
Sakuno, Fumihiko; Sonoda, Hirofumi; Honda, Satoshi; and Kumagae, Ryouhei, 4,964,791, Cl. 425-8.000.

Sony Corporation: *See*—
Kamon, Yoshiyuki; and Yamagishi, Makoto, 4,965,838, Cl. 381-187.000.
Kunihiro, Takushi, 4,965,849, Cl. 455-34.000.
Oka, Masaaki; and Kurauchi, Yoshitaka, 4,965,844, Cl. 382-44.000.
Okanobu, Taiwa, 4,965,528, Cl. 330-252.000.
Otani, Takahide, 4,965,683, Cl. 360-94.000.

Sorg GmbH & Co. KG: *See*—
Sorg, Helmut; Pieper, Helmut; and Kessel, Rudolf, 4,965,812, Cl. 373-36.000.

Sorg, Helmut; Pieper, Helmut; and Kessel, Rudolf, to Sorg GmbH & Co. KG. Electrode for a glass melting. 4,965,812, Cl. 373-36.000.

Southport Enterprises: *See*—
Churchill, John W., 4,965,436, Cl. 219-544.000.

Sozzi, Tomaso: *See*—
Hose, Hugh; Sozzi, Tomaso; and Wood, Robert D., 4,965,079, Cl. 426-43.000.

Space Services, Incorporated: *See*—
Daniels, Mark H.; Funk, Jack; Evans, Wyendell B.; and Varner, Christopher C., 4,964,340, Cl. 102-377.000.

Sparks, Thomas C., to Bell-Northern Research Ltd. Adaptive timing. 4,965,811, Cl. 375-109.000.
Specht, Lahna J. Bouquet assembly device. 4,964,237, Cl. 47-41.010.
Spector, Robert J., to Minnesota Mining and Manufacturing Company. Dam for shield terminators. 4,965,410, Cl. 174-78.000.
Spectroscopy Imaging Systems: *See—*
Egloff, Heinz, 4,965,521, Cl. 324-312.000.
Spencer, Bonnie L.: *See—*
Spencer, Kevin F.; and Spencer, Bonnie L., 4,964,824, Cl. 441-57.000.
Spencer, Kevin F.; and Spencer, Bonnie L. Swimming glove. 4,964,824, Cl. 441-57.000.
Speronello, Barry K., to Engelhard Corporation. Novel zeolite fluid cracking catalysts and preparation thereof from mixtures of calcined clay. 4,965,233, Cl. 502-65.000.
Sperry Marine Inc.: *See—*
Maine, Reuben E., 4,965,808, Cl. 375-1.000.
Sphar, Robert A.: *See—*
Smilanich, Nicholas J.; and Sphar, Robert A., 4,965,507, Cl. 320-48.000.
Spica, Joseph P., to 2500 Corporation, The. Gutter screening and flushing system. 4,964,247, Cl. 52-12.000.
Spiro, Alan I.: *See—*
Bennett, Paul T.; Willard, David F.; Tahernia, Omid; Page, James C.; Spiro, Alan I.; and Lambrecht, Frank E., 4,965,569, Cl. 340-825.440.
Spittal, Douglas W.: *See—*
Roberts, Edward A.; Spittal, Douglas W.; and Kisiel, Stanley T., 4,965,103, Cl. 428-31.000.
Spix, Theo: *See—*
Korte, Heinrich; and Spix, Theo, 4,965,875, Cl. 362-217.000.
Splinter, Bob C., to H. Van Eldern Holding B.V. Vehicle anti-theft system. 4,964,677, Cl. 303-89.000.
Sporlan Valve Company: *See—*
Heffner, Joseph H.; Seener, G. Thomas; and Hoehne, Dennis L., 4,964,567, Cl. 236-92.00B.
Sporn, Joseph S. Strain-reducing dog harness. 4,964,369, Cl. 119-96.000.
Sport Maska, Inc.: *See—*
Laberge, Raymond, 4,964,229, Cl. 36-93.000.
SPR International, Inc.: *See—*
Stevens, Clarence L., 4,964,569, Cl. 239-13.000.
Sprangers, Keith J.: *See—*
Mainland, Donald R.; and Sprangers, Keith J., 4,964,232, Cl. 42-44.000.
Spreen, James H.: *See—*
Duspiva, Walter S.; Gillett, John B.; and Spreen, James H., 4,965,712, Cl. 363-126.000.
Square D Company: *See—*
Dvorak, Robert F.; and Swenson, Kurt W., 4,965,694, Cl. 361-64.000.
Srinivasan, Anantha chari: *See—*
Fritzberg, Alan R.; Kasina, Sudhakar; Rao, Tripuraneni N.; VanderHeyden, Jean-Luc; and Srinivasan, Anantha chari, 4,965,392, Cl. 558-254.000.
Sta-Rite Industries, Inc.: *See—*
Marietta, Walter E., 4,964,433, Cl. 137-115.000.
Stachowiak, Robert W.; Puccio, Anthony J.; and Eberhart, Thomas J., to Goodyear Tire & Rubber Company, The. Synthesis of polydiene rubber by high solids solution polymerization. 4,965,327, Cl. 526-88.000.
Stadler, Eberhard; Eger, Matthias; Melcher, Franz-Josef; and Martens, Veronika, to Sartorius AG. Electronic balance with scale on top. 4,964,478, Cl. 177-229.000.
Stadler, Jeffrey A.; and Flygare, Wayne A., to Sundstrand Corporation. Integrated drive generator with permanent magnet generator on second shaft. 4,965,477, Cl. 310-114.000.
Stadnick, Steven J.: *See—*
Rogers, Howard H.; and Stadnick, Steven J., 4,965,145, Cl. 429-101.000.
Staehly, Christopher E.: *See—*
Young, Paul R.; Richard, David W.; Treff, Arthur J.; and Staehly, Christopher E., 4,965,686, Cl. 360-98.070.
Staerzl, Richard E., to Brunswick Corporation. Engine overspeed control. 4,964,385, Cl. 123-335.000.
Stahlecker, Fritz, to Stahlecker, Hans, a part interest. Process and an arrangement for the piecing of a double yarn after a yarn breakage. 4,964,268, Cl. 57-261.000.
Stahlecker, Hans: *See—*
Stahlecker, Fritz, 4,964,268, Cl. 57-261.000.
Stamatoyannopoulos, George, to University of Washington, The Board of Regents of The. Pulse treatment of hemoglobinopathies with erythropoietin. 4,965,251, Cl. 514-8.000.
Standard Oil Company, The: *See—*
Budge, John R.; and Attig, Thomas G., 4,965,378, Cl. 549-508.000.
Stankiewicz, Edwin P., to Stemcor Corporation. Multiple-use molten metal filters. 4,964,993, Cl. 210-510.100.
Stanley, John E., deceased: *See—*
Kinard, William H.; Singer, S. Fred; Wortman, Jim J.; Humes, Donald H.; Kassel, Philip C., Jr.; and Stanley, John E., deceased, 4,964,300, Cl. 73-170.00R.
Stanley, Marguerite, executrix: *See—*
Kinard, William H.; Singer, S. Fred; Wortman, Jim J.; Humes, Donald H.; Kassel, Philip C., Jr.; and Stanley, John E., deceased, 4,964,300, Cl. 73-170.00R.
Stansfield, Peter W.; and Reed, Alastair, to Crosfield Electronics Limited. Image processing. 4,965,754, Cl. 364-526.000.
Staring, Aemilianus G. J., to U.S. Philips Corporation. Method of manufacturing an epitaxial indium phosphide layer on a substrate surface. 4,965,222, Cl. 437-81.000.
Starke, Carl I.: *See—*
Brandstrom, Arne E.; Lindberg, Per L.; Starke, Carl I.; and Sunden, Gunnel E., 4,965,269, Cl. 514-253.000.
Starp, Franz: *See—*
Breyer, Karl-Hermann; and Starp, Franz, 4,964,221, Cl. 33-503.000.
Starr, Stephen G.: *See—*
Karner, Friedrich A.; Phelps, Douglas W., Jr.; Starr, Stephen G.; and Ward, William C., 4,965,654, Cl. 357-70.000.
State University of New York: *See—*
Subbarao, Muralidhara, 4,965,840, Cl. 382-1.000.
STC PLC: *See—*
Scovell, Peter D.; Blomley, Peter F.; and Baker, Roger L., 4,965,216, Cl. 437-31.000.
Stearman, Roger R.: *See—*
Ruble, Frank D.; Stearman, Roger R.; and Smith, Robert A., 4,964,242, Cl. 51-144.000.
Steckenreuter, Klaus: *See—*
Wieland, Gerhard; Steckenreuter, Klaus; Gernand, Wolfgang; and Simgen, Helmut, 4,964,521, Cl. 215-32.000.
Sted Engineering S.R.L.: *See—*
Negrussi, Luigi, 4,964,585, Cl. 242-56.00R.
Steele, Robin L.: *See—*
Winchell, Michael A.; and Steele, Robin L., 4,965,741, Cl. 364-513.000.
Steer, Peter L., to E. R. Squibb & Sons, Inc. Securing an outlet pipe or tap to a liquid-containing bag. 4,964,856, Cl. 604-326.000.
Stefanescu, Alexander: *See—*
Braun, Peter B.; Hauser, Herbert P.; and Stefanescu, Alexander, 4,964,288, Cl. 70-406.000.
Stefansky, Frederick M., to Conner Peripherals, Inc. Low height disk drive. 4,965,684, Cl. 360-78.120.
Steffes, Helmut: *See—*
Burgdorf, Jochen; Reinartz, Hans-Dieter; Steffes, Helmut; Von Hayn, Holger; Volz, Peter; Wupper, Hans; Buschmann, Gunther; Beck, Erhard; Dehio, Gottfried; Dinkel, Dieter; and Rausch, Juergen, 4,964,681, Cl. 303-116.000.
Steinberg, Suzi: *See—*
Sagiv, Jacob; Rubinstein, Israel; Steinberg, Suzi; Shanzer, Abraham; and Tor, Yitzhak, 4,964,972, Cl. 204-418.000.
Steinbichler, Hans; and Willer, Jurgen. Process of making artificial teeth. 4,964,770, Cl. 433-223.000.
Steiner, Walter R.: *See—*
Economy, Richard; Steiner, Walter R.; and Fadden, Richard G., Jr., 4,965,745, Cl. 364-518.000.
Steinhoff, Karl, to Muhr und Bender, Maschinenbau GmbH. Machine tool. 4,964,326, Cl. 838-559.000.
Steinmann, Alfred, to Ciba-Geigy Corporation. Radiation sensitive polymers and use thereof. 4,965,316, Cl. 525-100.000.
Stemcor Corporation: *See—*
Stankiewicz, Edwin P., 4,964,993, Cl. 210-510.100.
Stendel, Wilhelm; Neuhauser, Hubert; and Koeniger, Nikolaus, to Bayer Aktiengesellschaft. Method for controlling parasitosis in bees. 4,965,287, Cl. 514-531.000.
Stenlund, Stig, to Hypeco AB. Heat exchanger. 4,964,459, Cl. 165-119.000.
Stephan, Bernd, to Goetze AG. Shaft sealing ring. 4,964,647, Cl. 277-153.000.
Stephan, Wolfgang; Dichtelmuller, Herbert; and Kloft, Michael, to Biotest Pharma GmbH. Polyvalent hyperimmunoglobulin preparation. 4,965,068, Cl. 424-87.000.
Stephen, John F.: *See—*
Hartmann, Ludwig A.; and Stephen, John F., 4,965,394, Cl. 558-425.000.
Stephens, Chandra D. Case for feminine hygiene products. 4,964,526, Cl. 220-22.000.
Steranka, Frank M., to Hewlett-Packard Company. Method of manufacturing a partially opaque substrate red led. 4,965,223, Cl. 437-127.000.
Stetsovich, Viktor I.: *See—*
Goldovsky, Viktor L.; Stetsovich, Viktor I.; and Zayats, Andrei J., 4,964,725, Cl. 356-308.000.
Stevens, Clarence L., to SPR International, Inc. Warm air spray system. 4,964,569, Cl. 239-13.000.
Stewart, John V. Ladder stabilizer. 4,964,488, Cl. 182-172.000.
Stewart, Roger G.: *See—*
Ipri, Alfred C.; and Stewart, Roger G., 4,965,646, Cl. 357-23.700.
Steyr-Daimler-Puch AG: *See—*
Weinberger, Gottfried, 4,964,445, Cl. 141-346.000.
Stichman, Robert W.: *See—*
Brown, Richard K.; and Stichman, Robert W., 4,964,918, Cl. 106-811.000.
Stichting Voor de Technische Wetenschappen: *See—*
Brinkman, Egbert; and Bantjes, Adriaan, 4,965,112, Cl. 428-36.910.
Stiller, Gordon L.: *See—*
Hubbell, James C.; Stiller, Gordon L.; and Liegeois, David D., 4,964,454, Cl. 164-246.000.
Stipek, Theodor: *See—*
Schueler, Hans; Lauterbach, Heinz; Tschoeke, Helmut; Kinzel, Richard; and Stipek, Theodor, 4,964,789, Cl. 417-494.000.
Stoeckigt, Dieter: *See—*
Baur, Richard; Stoeckigt, Dieter; Neumann, Hans-Werner; Goertz, Hans-Helmut; and Wagner, Norbert, 4,965,009, Cl. 252-142.000.

Stone Construction Equipment, Inc.: *See*—
Ciminelli, Michael A.; Buck, Jack; Weaver, Charles G.; and Fowler, Darryle E., 4,964,753, Cl. 404-122.000.

Stone, William C. Breathing apparatus. 4,964,404, Cl. 128-204.220.

Stoneman, Robert C.: *See*—
Esterowitz, Leon; and Stoneman, Robert C., 4,965,803, Cl. 372-5.000.

Storage Technology Corporation: *See*—
Von Brandt, Kim; Blakeslee, Bruce L.; Keil, John, Jr.; and Stroud, Robert D., 4,964,941, Cl. 156-360.000.

Storage Technology Partners II: *See*—
Mathews, Harlan P., 4,965,782, Cl. 369-48.000.

Storch, Helmut: *See*—
Ubelacker, Horst; Storch, Helmut; and Buchwald, Peter, 4,964,794, Cl. 425-117.000.

Storey, David W.: *See*—
Almond, Gary R.; and Storey, David W., 4,965,787, Cl. 370-58.100.

Strasyer, Ronald J., to Gerber Scientific Instrument Company, The. Method and apparatus providing skip line asynchronous imaging. 4,965,749, Cl. 364-520.000.

Strazdins, Atis, to Strazdins (International) Pty. Limited. Double piston colorant dispenser. 4,964,534, Cl. 222-43.000.

Strazdins (International) Pty. Limited: *See*—
Strazdins, Atis, 4,964,534, Cl. 222-43.000.

Streu, Rick D.: *See*—
Halm, Roland L.; Zapp, Regie H.; and Streu, Rick D., 4,965,388, Cl. 556-472.000.

Stringfield, Richard T.: *See*—
Norman, Seth I.; Stringfield, Richard T.; and Gopsill, Christopher C., 4,965,083, Cl. 426-422.000.

Strobl, Karlheinz: *See*—
Cuykendall, Robert R.; and Strobl, Karlheinz, 4,965,760, Cl. 364-713.000.

Strohmeyer, Willi, to Geha-Werke GmbH. Document shredder with one or more trays for stacks of paper in continuous form. 4,964,579, Cl. 241-100.000.

Strong, Russell W.: *See*—
Cromheecke, Eric L. A.; and Strong, Russell W., 4,964,838, Cl. 460-66.000.

Stroud, Robert D.: *See*—
Von Brandt, Kim; Blakeslee, Bruce L.; Keil, John, Jr.; and Stroud, Robert D., 4,964,941, Cl. 156-360.000.

Stuck, John E., to United Floorcare Systems, Inc. Floor mop head having removable scuff pad. 4,964,186, Cl. 15-118.000.

Sturdy Corporation: *See*—
Sturdy, H. D., 4,964,276, Cl. 60-700.000.

Sturdy, H. D., to Sturdy Corporation. Engine synchronizer. 4,964,276, Cl. 60-700.000.

Sturm, Steven P., to Process Automation Business, Inc. Infrared analysis of paper printability. 4,965,452, Cl. 250-339.000.

Su, Tien-Kuei: *See*—
Shaw, Richard G.; and Su, Tien-Kuei, 4,965,034, Cl. 264-211.000.

Suarato, Antonino: *See*—
Caruso, Michele; Suarato, Antonino; Angelucci, Francesco; and Arcamone, Federico, 4,965,351, Cl. 536-6.400.

Subbarao, Muralidhara, to State University of New York. Method and apparatus for determining the distances between surface-patches of a three-dimensional spatial scene and a camera system. 4,965,840, Cl. 382-1.000.

Suda, Shigeyuki; and Hattori, Jun, to Canon Kabushiki Kaishi. Image-forming lens. 4,964,703, Cl. 350-413.000.

Suehiro, Kikumitsu: *See*—
Ashihara, Ryohei; Suehiro, Kikumitsu; Yabuta, Masayuki; and Yamagishi, Hideaki, 4,965,149, Cl. 429-168.000.

Suematsu, Koichi; Yamada, Sumito; Yasuda, Tomokazu; Yamanouchi, Junichi; and Mukunoki, Yasuo, to Fujii Photo Film Co., Ltd. Silver halide photographic material. 4,965,180, Cl. 430-518.000.

Sugarek, Chester A., Jr.: *See*—
Sugarek, Steven L.; and Sugarek, Chester A., Jr., 4,964,683, Cl. 312-207.000.

Sugarek, Steven L.; and Sugarek, Chester A., Jr. Pill reminder apparatus. 4,964,683, Cl. 312-207.000.

Sugarman, Louis; and Dressler, Max B., to Alcraft, Inc. Holder for a dispenser for tape marker flags. 4,964,519, Cl. 211-50.000.

Suggs, Patricia A. Nail cutting device and associated method for treating and/or preventing ingrown nails. 4,964,213, Cl. 30-28.000.

Sugimoto, Masaru; Kohno, Osamu; Ikeno, Yoshimitsu; Sadakata, Nobuyuki; Nakagawa, Mikio; Aoki, Shin'ya; Tan, Masayuki; Okisi, Ryuichi; Yoshida, Syotaro; Hasegawa, Masakazu; and Yamanouchi, Hiroshi, to Fujikura Ltd. Method of producing oxide superconducting cables and coils using copper alloy filament precursors. 4,965,245, Cl. 505-1.000.

Sugimoto, Yoshio; Muto, Ryujiro; and Arakaki, Takeji, to Asahi Glass Company, Ltd. Liquid crystal display device having a light shielding layer being a complementary color to the color filter. 4,964,702, Cl. 350-339.00R.

Sugiura, Tomiya: *See*—
Funami, Fumiyasu; Kitsunezuka, Akira; Arai, Shigeharu; Sakuma, Nobuhiro; Okawara, Atsuo; and Sugiura, Tomiya, 4,965,297, Cl. 523-217.000.

Sugiyama, Yoshiaki; and Sagae, Kyuta, to Terumo Kabushiki Kaisha. Catheter equipped with expansible member. 4,964,853, Cl. 604-96.000.

Sullivan, Gail W.: *See*—
Mandell, Gerald L.; Sullivan, Gail W.; and Novick, William J., 4,965,271, Cl. 514-263.000.

Sullivan, Inc.: *See*—
Sullivan, Marian D.; and Deelstra, Elaine A., 4,964,796, Cl. 431-289.000.

Sullivan, James J., to Hewlett-Packard Company. Microwave resonant cavity. 4,965,540, Cl. 333-227.000.

Sullivan, Marian D.; and Deelstra, Elaine A., to Sullivan, Inc. Swag centerpiece with taper candle/chimney glass insert. 4,964,796, Cl. 431-289.000.

Sullivan, Michael J.; Dussault, Douglas G.; and Dinsmore, Daniel, Jr., to United States of America, Navy. Underwater towed body stabilizing device. 4,964,356, Cl. 114-244.000.

Sumida, Kunio A. Weight scale compensating for tare. 4,964,479, Cl. 177-233.000.

Sumio, Hiroshi: *See*—
Shikaumi, Masao; Nagata, Toru; Washisu, Koichi; and Sumio, Hiroshi, 4,965,619, Cl. 354-410.000.

Sumitomo Chemical Company, Limited: *See*—
Ikeda, Takashi; Takagishi, Hisao; and Saka, Terumasa, 4,964,872, Cl. 8-115.660.
Yuyama, Masahiro; Koyama, Teruhisa; Matsurra, Hideaki; and Date, Shinji, 4,965,321, Cl. 525-329.700.

Sumitomo Electric Industries, Ltd.: *See*—
Hata, Ryosuke; Yamanouchi, Shosuke; Hirose, Masayuki; Kuwabara, Hidemitsu; Mizumoto, Yasuharu; and Hagiuda, Yasuhiro, 4,964,933, Cl. 156-209.000.
Murai, Teruyuki; Hashimoto, Yoshihiro; and Kawakita, Takao, 4,964,209, Cl. 29-527.600.
Nishiguchi, Masanori, 4,965,247, Cl. 505-1.000.
Nokubo, Seiji; Kohno, Teruhisa; Hashida, Koichi; Matsumoto, Atsuo; and Higashimura, Hideaki, 4,964,680, Cl. 303-115.000.
Sasame, Akira; Sakanoue, Hitoyuki; Miyake, Masaya; and Yamakawa, Akira, 4,965,659, Cl. 357-81.000.
Suzawa, Chizuru, 4,965,246, Cl. 505-1.000.

Sumitomo Rubber Industries Ltd.: *See*—
Katayama, Hideaki; Murakami, Toshifumi; Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; and Ijiri, Masaaki, 4,964,792, Cl. 425-32.000.

Summers, David P.; and Nixon, Jeddy D., to American Biomed, Inc. Heart assist pump. 4,964,864, Cl. 623-3.000.

Sun Chemical Corporation: *See*—
Catena, Robert, 4,964,916, Cl. 106-228.000.

Sunden, Gunnel E.: *See*—
Brandstrom, Arne E.; Lindberg, Per L.; Starke, Carl I.; and Sunden, Gunnel E., 4,965,269, Cl. 514-253.000.

Sundstrand Corporation: *See*—
Scott, James C., 4,964,790, Cl. 418-1.000.
Stadler, Jeffrey A.; and Flygare, Wayne A., 4,965,477, Cl. 310-114.000.

Surles, Billy W., to Texaco Inc. Method employing liquidized sand for controlling lost circulation of drilling fluids. 4,964,465, Cl. 166-295.000.

Surti, Tyrone N. Electrophotographic copier process kit having removable closure members. 4,965,633, Cl. 355-200.000.

Sussnapp, Gunter: *See*—
Goldkuhle, Gerhard; and Sussnapp, Gunter, 4,964,982, Cl. 209-539.000.

Sutherland, Brian J.: *See*—
Van Leeuwen, Hendrikus J.; Freeman, Norman H.; Sutherland, Brian J.; and Jameson, Graeme W., 4,965,078, Cl. 424-40.000.

Suto, Shohei, to Taiyo Kogyo Co. Ltd. Air cushion vehicle toy. 4,964,835, Cl. 446-154.000.

Suwa, Kyoichi: *See*—
Kato, Kinya; Ushida, Kazuo; Namikawa, Toshiyuki; Matsumoto, Koichi; Suwa, Kyoichi; and Ohno, Koichi, 4,965,630, Cl. 355-52.000.

Suzawa, Chizuru, to Sumitomo Electric Industries, Ltd. Current-carrying lead formed of a ceramic superconductive material carried by a support. 4,965,246, Cl. 505-1.000.

Suzuka, Susumu: *See*—
Hashimoto, Mitsuru; Shimada, Tomoyuki; Suzuki, Nobuo; Sakai, Takayuki; Suzuka, Susumu; and Sasaki, Masaomi, 4,965,157, Cl. 430-80.000.

Suzuki, Chiaki: *See*—
Nagatsuka, Ikutaroh; Matsumura, Yasuo; Takeda, Masayuki; Suzuki, Chiaki; and Aoki, Takayoshi, 4,965,160, Cl. 430-108.000.

Suzuki, Hideo: *See*—
Oohashi, Keiji; Suzuki, Hideo; Araki, Shinji; and Shimomichi, Tsuyoshi, 4,964,694, Cl. 350-96.330.

Suzuki Jidosha Kogyo Kabushiki Kaisha: *See*—
Murano, Katsuaki; Hirano, Sadayuki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 4,964,317, Cl. 74-844.000.

Suzuki, Katsuhiko: *See*—
Akiyama, Eitetsu; and Suzuki, Katsuhiko, 4,964,386, Cl. 123-339.000.

Suzuki, Masao; Miyamoto, Ryosuke; Fukushima, Nobuo; and Ogawa, Takeshi, to Canon Kabushiki Kaisha. Color information detecting device. 4,965,449, Cl. 250-226.000.

Suzuki, Minoru; Minefuji, Nobutaka; and Fujimoto, Osamu, to Asahi Kogaku Kogyo Kabushiki Kaisha; and Sharp Kabushiki Kaisha. Color separating optical apparatus. 4,964,696, Cl. 350-315.000.

Suzuki, Nobuo; Sakasai, Yutaka; and Usui, Tetuo, to Fuji Photo Film Co., Ltd. Liquid developer for electrostatic image. 4,965,163, Cl. 430-114.000.

Suzuki, Nobuo: *See*—
Hashimoto, Mitsuru; Shimada, Tomoyuki; Suzuki, Nobuo; Sakai, Takayuki; Suzuka, Susumu; and Sasaki, Masaomi, 4,965,157, Cl. 430-80.000.

Suzuki, Osamu: *See*—
Tachikawa, Makoto; Suzuki, Osamu; Hashimoto, Tadahiko; Igari, Kuniyuki; and Katsuyama, Ichirou, 4,964,719, Cl. 353-85.000.

Suzuki, Shigeki: *See*—
Seko, Kiyoshi; Hatano, Masato; and Suzuki, Shigeki, 4,964,258, Cl. 53-75.000.

Suzuki, Shigeo: *See*—
Ogata, Masatsugu; Segawa, Tadanori; Abe, Hidetoshi; Suzuki, Shigeo; and Kawata, Tatsuo, 4,965,657, Cl. 357-72.000.

Suzuki, Shinichi, to Nikon Corporation. Electric cell housing device for camera. 4,965,141, Cl. 429-9.000.

Suzuki, Toshio, to Mass-Set Kabushiki Kaisha. Toy construction blocks with connectors. 4,964,833, Cl. 446-118.000.

Suzuki, Yasuyuki: *See*—
Abe, Toshio; Takahashi, Seiichi; Kamihara, Masaharu; Saito, Hitoshi; Tanaka, Seizo; and Suzuki, Yasuyuki, 4,965,483, Cl. 310-324.000.

Swan, Ellen L.; Basu, Rajat S.; and Rodgers, Joel E., to Allied-Signal Inc. Azeotrope-like compositions of 1,1-dichloro-1-fluoroethane, dichlorotrifluoroethane, and nitromethane. 4,965,011, Cl. 252-171.000.

Swan, Larry G.; and Wood, Ronald C., Jr., to Mobil Oil Corporation. Opaque oriented polymeric film structure and method of preparing same. 4,965,123, Cl. 428-314.400.

Swanic, Anthony, to Arbus Inc. Secure optical-fiber communication system. 4,965,856, Cl. 455-617.000.

Sweeney, Michael A., to International Business Machines Corporation. Fast access priority queue for managing multiple messages at a communications node or managing multiple programs in a multiprogrammed data processor. 4,965,716, Cl. 364-200.000.

Swenson, Kurt W.: *See*—
Dvorak, Robert F.; and Swenson, Kurt W., 4,965,694, Cl. 361-64.000.

Swett, Ralph R. Paint stripping composition containing ketones, methanol, and aromatic hydrocarbon. 4,965,010, Cl. 252-170.000.

Swinney, Gary D.; and Chenot, Richard H. Oil filter accessory. 4,964,330, Cl. 81-64.000.

Swiss Aluminium Ltd.: *See*—
Frei, Olaf; Frish, Max; Bodmer, Viktor; and Mizrah, Tiberiu, 4,965,101, Cl. 427-255.000.

Swiss Aluminum Ltd.: *See*—
Dean, Robert J., 4,964,289, Cl. 72-13.000.

Sylvia Industries Ltd.: *See*—
Ng, Andrew S. O.; and Ling, Peter P. T., 4,965,144, Cl. 429-55.000.

Sym-Tek Systems, Inc.: *See*—
Riechelmann, Bernd, 4,964,808, Cl. 439-264.000.

Symannek, Horst: *See*—
Hoffmann, Gottfried; Deutsch, Reinhard; and Symannek, Horst, 4,964,501, Cl. 198-418.300.

Syquest Technology: *See*—
Iftikar, Syed H.; and Mandish, John J., 4,965,691, Cl. 360-133.000.
Thompson, Herbert E.; Rolph, Donald L.; Mercurio, Dominic; and Guerini, Albert J., 4,965,685, Cl. 360-97.010.

Szecsey nee Hegedus, Maria: *See*—
Rozsa, Laszlo; Petocz, Lujza; Szirt nee Kiszelly, Eniko; Fekete, Marton; Szecsey nee Hegedus, Maria; Gigler, Gabor; and Gacsalyi, Istvan, 4,965,259, Cl. 514-183.000.

Szirt nee Kiszelly, Eniko: *See*—
Rozsa, Laszlo; Petocz, Lujza; Szirt nee Kiszelly, Eniko; Fekete, Marton; Szecsey nee Hegedus, Maria; Gigler, Gabor; and Gacsalyi, Istvan, 4,965,259, Cl. 514-183.000.

Szwarc, Joseph M., to Becton, Dickinson and Company. Needle sheath assembly. 4,964,866, Cl. 604-192.000.

TA Triumph-Adler Aktiengesellschaft: *See*—
Haftmann, Johannes; and Haczek, Werner, 4,964,743, Cl. 400-208.100.

Tabankia, Farshid M. H.; and de Boer, Jan, to General Electric Company. PBT with improved tracking resistance. 4,965,338, Cl. 528-272.000.

Tachibana, Tetsuo: *See*—
Nishino, Tetsuo; Isono, Osamu; Tachibana, Tetsuo; Iwabuchi, Eisuke; and Fukui, Toshimasa, 4,965,790, Cl. 370-85.120.

Tachikawa, Makoto; Suzuki, Osamu; Hashimoto, Tadahiko; Igari, Kuniyuki; and Katsuyama, Ichirou, to Hitachi, Ltd. Control method of brightness of screen used for projection display and control apparatus of the same. 4,964,719, Cl. 353-85.000.

Tacq, Jo; Ligneel, Roger; and Shaw, Henry, to Picanol N.V. Reserve weft thread supply mechanism with device for changing thread type. 4,964,442, Cl. 139-452.000.

Tadokoro, Michihiro; and Okada, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Optical head including a collimator having lenses of different focal lengths. 4,965,785, Cl. 369-112.000.

Tadokoro, Toyohiko: *See*—
Naksanishi, Tatsuo; Tadokoro, Toyohiko; and Fujimura, Masaki, 4,964,640, Cl. 273-167.00H.

Tafoya, Craig, to AutoBoat Corporation. Jet powered rigid inflatable boat with dead-man switch. 4,964,821, Cl. 440-38.000.

Taft, Jeffrey D.; and Ellison, James F., to Westinghouse Electric Corp. Parametric path modeling for an optical automatic seam tracker and real time robotic control system. 4,965,499, Cl. 318-568.110.

Taggart, John E.: *See*—
Yang, Kei-Wean C.; Taggart, John E.; Hayes, Raymond; and Peter, Joseph R., 4,965,648, Cl. 357-24.000.

Taguchi, Katsuhisa: *See*—
Ebe, Kazuyoshi; Narita, Hiroaki; Taguchi, Katsuhisa; Akeda, Yoshitaka; and Saito, Takanori, 4,965,127, Cl. 428-343.000.

Tahernia, Omid: *See*—
Bennett, Paul T.; Willard, David F.; Tahernia, Omid; Page, James C.; Spiro, Alan I.; and Lambrecht, Frank E., 4,965,569, Cl. 340-825.440.

Taigen, Roger L. Weightlifting belt. 4,964,401, Cl. 128-78.000.

Taipale, Kari; and Ojala, Timo, to Oy Tampella AB. Device for feeding a tape in severing a web. 4,964,584, Cl. 242-56.00R.

Taito Company, Ltd.: *See*—
Yanaki, Toshio; Maehata, Shigeki; Satoh, Tomoko; and Ikeda, Shinji, 4,965,354, Cl. 536-124.000.

Taiyo Kogyo Co. Ltd.: *See*—
Suto, Shohei, 4,964,835, Cl. 446-154.000.

Takabayashi, Hiroshi, to Canon Kabushiki Kaisha. Connection structure between a liquid crystal panel and an external circuit. 4,964,700, Cl. 350-336.000.

Takada, Kazunori; Yamamura, Yasuharu; and Kondo, Shigeo, to Matsushita Electric Industrial Co., Ltd. Solid-state electrochemical cell. 4,965,151, Cl. 429-191.000.

Takada, Takashi; and Hirao, Kenichi, to Toray Industries, Inc. High bending strength, large impact strength hydraulic substances reinforced with acrylonitrile fibers and a process for production thereof. 4,964,913, Cl. 106-808.000.

Takagi, Kunio, to Aisan Kogyo Kabushiki Kaisha. Method of connecting stator coil of motor. 4,964,210, Cl. 29-596.000.

Takagi, Tadao; Sato, Toshihiro; and Saegusa, Takashi, to Nikon Corporation. Camera. 4,965,620, Cl. 354-416.000.

Takagi, Tomoe: *See*—
Yokoe, Masaaki; Kurono, Yoshikazu; Hayashi, Koji; Takagi, Tomoe; Matsushita, Narihiro; and Takagi, Yuzo, 4,964,352, Cl. 112-103.000.

Takagi, Yuzo: *See*—
Yokoe, Masaaki; Kurono, Yoshikazu; Hayashi, Koji; Takagi, Tomoe; Matsushita, Narihiro; and Takagi, Yuzo, 4,964,352, Cl. 112-103.000.

Takagishi, Hisao: *See*—
Ikeda, Takashi; Takagishi, Hisao; and Saka, Terumasa, 4,964,872, Cl. 8-115.660.

Takahashi, Kyohei: *See*—
Mizobuchi, Akira; Hida, Yoshiaki; Umise, Shigeki; Yamamoto, Kyoichi; and Takahashi, Kyohei, 4,965,132, Cl. 428-411.100.

Takahashi, Mitsuasa, to NEC Corporation. Vertical MOS field effect transistor having a high withstand voltage and a high switching speed. 4,965,647, Cl. 357-23.400.

Takahashi, Nobuyuki, to Mitsubishi Corporation. Method for the freeze-pressure molding of inorganic powders. 4,965,027, Cl. 264-28.000.

Takahashi, Noriyoshi: *See*—
Karakida, Kenichi; Yagi, Shigeru; Fukuda, Yuzuru; Nishikawa, Masayuki; Roh, Te Nam; Takahashi, Noriyoshi; and Ono, Masato, 4,965,154, Cl. 430-58.000.

Takahashi, Sadayuki: *See*—
Ohnishi, Osamu; Takahashi, Sadayuki; Myohga, Osamu; Uchikawa, Tadao; Inoue, Takeshi; Kagaya, Isao; and Ueha, Sadayuki, 4,965,482, Cl. 310-323.000.

Takahashi, Seiichi: *See*—
Abe, Toshio; Takahashi, Seiichi; Kamihara, Masaharu; Saito, Hitoshi; Tanaka, Seizo; and Suzuki, Yasuyuki, 4,965,483, Cl. 310-324.000.

Takahashi, Tokihiro: *See*—
Tsuchida, Masami; Miyake, Ichiro; Takahashi, Tokihiro; Wakumura, Shinichi; Iso, Yoshimi; Arai, Takao; and Okamoto, Hiroo, 4,965,867, Cl. 341-118.000.

Takahashi, Toshio: *See*—
Umetsu, Yukihide; Hasegawa, Hideo; Takahashi, Toshio; and Miyagawa, Masayuki, 4,964,522, Cl. 215-100.00A.

Takajo, Shigeaki: *See*—
Kiyota, Yoshisato; Ohta, Junichi; Ohtsubo, Hiroshi; and Takajo, Shigeaki, 4,964,907, Cl. 75-235.000.

Takamura, Norio; Inoue, Isao; Inage, Masaru; Yamaguchi, Isao; and Yano, Koji, to Tanabe Seiyaku Co., Ltd. Benzodioxole derivatives, pharmaceutical compositions and use. 4,965,282, Cl. 514-406.000.

Takasago International Corporation: *See*—
Mikami, Koichi; Terada, Masahiro; Nakai, Takeshi; Sayo, Noboru; and Kumobayashi, Hidenori, 4,965,398, Cl. 560-60.000.

Takata, Harry H., to Ag-Chem Equipment Co., Inc. Boom flow control mechanism for pneumatic spreaders. 4,964,575, Cl. 239-655.000.

Takayama, Mitsunao; Nakazawa, Takeshi; Yamauchi, Kozo; and Asano, Atsushi, to 501 Aichi Kikai Kogyo Kabushiki Kaisha. Continuously variable transmission. 4,964,841, Cl. 474-11.000.

Takeda, Masayuki: *See*—
Nagatsuka, Ikutaroh; Matsumura, Yasuo; Takeda, Masayuki; Suzuki, Chiaki; and Aoki, Takayoshi, 4,965,160, Cl. 430-108.000.

Takehara, Shuzo: *See*—
Nakao, Toru; Morita, Kenji; Hisadome, Masao; and Takehara, Shuzo, 4,965,264, Cl. 514-248.000.

Takemura, Hiroo: *See*—
Shizaki, Tomoo; Kawaguchi, Yoshiyuki; Nakano, Yasuhiko; Gotoda, Yusuke; and Takemura, Hiroo, 4,964,381, Cl. 123-73.00A.

Takeuchi, Atsushi, to Fujitsu Limited. Semiconductor device having programmable read only memory cells for specific mode. 4,965,768, Cl. 365-201.000.

Takeuchi, Esther S.: *See—*
Keister, Pamela P.; Mead, Ralph T.; Muffoletto, Barry C.; Takeuchi, Esther S.; Ebel, Steven J.; Zelinsky, Michael A.; and Greenwood, John M., 4,964,877, Cl. 29-623.100.

Takeuchi, Hiroshi: *See—*
Gotou, Miyuki; and Takeuchi, Hiroshi, 4,965,428, Cl. 219-69.120.

Takeuchi, Kiyofumi: *See—*
Tanaka, Yasuyuki; Takeuchi, Kiyofumi; and Tamura, Yuji, 4,964,616, Cl. 252-299.630.

Takeuchi, Yoshiyuki: *See—*
Abe, Ryutaro; Takeuchi, Yoshiyuki; and Shibata, Kouichi, 4,964,983, Cl. 210-168.000.

Takeuchi, Yukihisa; and Watanabe, Tetsuo, to NGK Insulators, Ltd. Method of forming a copper film on a ceramic body. 4,964,923, Cl. 148-276.000.

Takeuchi, Yukihisa; and Yamamoto, Azuma, to NGK Insulators, Ltd. Recording head having spaced-apart electrodes. 4,965,589, Cl. 346-76.0PH.

Takeyama, Satoshi; and Matsumoto, Yasuo, to Nissan Motor Co., Ltd. Valve operating mechanism. 4,964,375, Cl. 123-315.000.

Takiguchi, Hideo: *See—*
Udagawa, Yoshiro; and Takiguchi, Hideo, 4,965,664, Cl. 358-80.000.

Takikawa, Kazunori: *See—*
Usui, Masayoshi; Washizu, Katsushi; and Takikawa, Kazunori, 4,964,658, Cl. 285-319.000.

Takimoto, Hiroyuki, to Canon Kabushiki Kaisha. Magnetic recording apparatus of rotary magnetic type having cross-talk cancelling function. 4,965,681, Cl. 360-64.000.

Takimoto, Yasuyuki: *See—*
Kawabata, Masami; Harada, Masahiko; and Takimoto, Yasuyuki, 4,965,171, Cl. 430-288.000.

Tamai, Yasuo: *See—*
Masaki, Kouichi; Kosha, Hideaki; Miura, Toshihiko; and Tamai, Yasuo, 4,965,125, Cl. 428-329.000.

Tamba, Shinichi; and Miguchi, Akio, to Kawasaki Jukogyo Kabushiki Kaisha. Engine cooling system. 4,964,378, Cl. 123-41.570.

Tambrands, Inc.: *See—*
Dunning, Walter B.; and Kinsley, John P., 4,964,852, Cl. 604-75.000.

Tame, Omar D.: *See—*
Rogala, Richard L.; and Tame, Omar D., 4,964,608, Cl. 248-429.000.

Tamer, Ergun: *See—*
Hendricks, Udo W.; Sanders, Josef; and Tamer, Ergun, 4,964,875, Cl. 8-442.000.

Tamura, Yuji: *See—*
Tanaka, Yasuyuki; Takeuchi, Kiyofumi; and Tamura, Yuji, 4,964,616, Cl. 252-299.630.

Tan, Masayuki: *See—*
Sugimoto, Masaru; Kohno, Osamu; Ikeno, Yoshimitsu; Sadakata, Nobuyuki; Nakagawa, Mikio; Aoki, Shin'ya; Tan, Masayuki; Okiai, Ryuichi; Yoshida, Syotaro; Hasegawa, Masakazu; and Yamanouchi, Hiroshi, 4,965,245, Cl. 505-1.000.

Tanabe Seiyaku Co., Ltd.: *See—*
Takamura, Norio; Inoue, Isao; Inage, Masaru; Yamaguchi, Isao; and Yano, Koji, 4,965,282, Cl. 514-406.000.

Tanabe, Takeshi: *See—*
Sakamoto, Yukio; Tanabe, Takeshi; Fukutani, Iwao; and Hori, Toshio, 4,964,806, Cl. 439-79.000.

Tanabe, Yoshiyuki: *See—*
Kameta, Katsunobu; Morita, Kiyomi; Kikuchi, Takeshi; and Tanabe, Yoshiyuki, 4,964,390, Cl. 123-489.000.

Tanaka, Akira; Fukamachi, Masaaki; and Sakata, Kazuhiro, to Honda Giken Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Honda Lock. Anti-theft system for a vehicle. 4,965,460, Cl. 307-10.200.

Tanaka, Katsumi: *See—*
Kawahara, Haruyuki; Tanaka, Katsumi; Ashiura, Yasuyuki; and Yoshimura, Motonobu, 4,964,801, Cl. 433-173.000.

Tanaka, Kimio; and Shiba, Haruo, to TDK Corporation. Tape cassette having outer housing layers of elastomeric material. 4,965,690, Cl. 360-132.000.

Tanaka, Seizo: *See—*
Abe, Toshio; Takahashi, Seiichi; Kamihara, Masaharu; Saito, Hitoshi; Tanaka, Seizo; and Suzuki, Yasuyuki, 4,965,483, Cl. 310-324.000.

Tanaka, Tetsuo: *See—*
Ohigashi, Chiaki; Iemura, Shigeru; Shimamura, Kazuhiro; and Tanaka, Tetsuo, 4,965,597, Cl. 346-157.000.

Tanaka, Tsutomu, to Sanyo Electric Co., Ltd. Low-temperature showcase. 4,964,281, Cl. 62-256.000.

Tanaka, Yasuhito: *See—*
Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; and Nakano, Takuo, 4,965,263, Cl. 514-247.000.

Tanaka, Yasuo: *See—*
Shirai, Shoji; Yamauchi, Masaaki; and Tanaka, Yasuo, 4,965,489, Cl. 313-449.000.

Tanaka, Yasuyuki; Takeuchi, Kiyofumi; and Tamura, Yuji, to Dainippon Ink and Chemicals, Inc. Tricyclic cyclohexenyl cyclohexane derivative. 4,964,616, Cl. 252-299.630.

Tandem Computers Incorporated: *See—*
Cutts, Richard W., Jr.; Mehta, Nikhil A.; and Jewett, Douglas E., 4,965,717, Cl. 364-200.000.

Tanguay, William: *See—*
Brodecki, James; Tanguay, William; and Fiene, Dale, 4,965,556, Cl. 340-628.000.

Tanigawa, Koichi: *See—*
Ohtsuka, Yasumasa; Hasegawa, Hiroto; and Tanigawa, Koichi, 4,965,747, Cl. 364-519.000.

Tanimoto, Yoshinori: *See—*
Handa, Yasunobu; Hoshimiya, Nozomu; Oda, Takashi; and Tanimoto, Yoshinori, 4,964,414, Cl. 128-784.000.

Tanioka, Soji: *See—*
Onda, Yoshiro; and Tanioka, Soji, 4,965,313, Cl. 525-59.000.

Tarasov, Valery F.: *See—*
Grischenko, Valentin I.; Kalugin, Jury V.; Paraschuk, Jury S.; Luchko, Nina A.; Chernysh, Elena N.; Tarasov, Valery F.; and Galchenko, Sergei E., 4,965,186, Cl. 435-2.000.

Tarbouriech, Jean-Claude: *See—*
Peguet, Pascal; Boulian, Eric; and Tarbouriech, Jean-Claude, 4,965,473, Cl. 307-530.000.

Targos, William M.: *See—*
Chao, Tai-Hsiang; Targos, William M.; and Moser, Mark D., 4,964,975, Cl. 208-139.000.

Tarkett AB: *See—*
Timm, Walter C.; and McNally, Michael H., 4,965,299, Cl. 523-437.000.

Tarumi, Kazuo; and Watanabe, Tsutomu, to Kabushiki Kaisha Toshiba. Halogen lamp envelope with roughened surface area and optical film. 4,965,485, Cl. 313-43.000.

Tasaki, Hirohisa; and Nakajima, Kunio, to Mitsubishi Denki Kabushiki Kaisha. Quantizer and inverse-quantizer. 4,965,580, Cl. 341-200.000.

Taschler, David R.: *See—*
Hayduk, Edward A., Jr.; Yext, Walter F.; and Taschler, David R., 4,965,092, Cl. 427-96.000.

Tassi, Lamberto: *See—*
Ballestrazzi, Aris; and Tassi, Lamberto, 4,964,263, Cl. 53-555.000.

Tatsumi, Takumi: *See—*
Murano, Katsuaki; Hirano, Sadayuki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 4,964,317, Cl. 74-844.000.

Tattam, Norman: *See—*
Moreland, Peter J.; and Tattam, Norman, 4,964,966, Cl. 204-280.000.

Taubitz, Christof; Seiler, Erhard; Hambrecht, Juergen; Mitulla, Konrad; and Reimann, Horst, to BASF Aktiengesellschaft. Thermoplastic molding materials based on nylons and styrene copolymers. 4,965,318, Cl. 525-179.000.

Taue, Jun; and Yoshida, Takeo, to Yamaha Hatsudoki Kabushiki Kaisha. Actuator for accumulator type fuel injection nozzle. 4,964,571, Cl. 239-88.000.

Tawada, Yoshihisa: *See—*
Yamagishi, Hideo; Nevin, William A.; Nishio, Hitoshi; Miki, Keiko; Tsuge, Kazunori; and Tawada, Yoshihisa, 4,965,225, Cl. 437-173.000.

Taylor, David H.; and Lyons, Michael R., to Rolls-Royce plc. Gas turbine engine fuel system. 4,964,270, Cl. 60-39.094.

Taylor, John W., Jr., to Westinghouse Electric Corp. High-power high-isolation switch. 4,965,604, Cl. 342-374.000.

Taylor, Mary W. Hair protecting device. 4,964,175, Cl. 2-171.000.

Taylor, Robert T.: *See—*
Wilmot, Donald W.; and Taylor, Robert T., 4,964,591, Cl. 244-3.160.

TDK Corporation: *See—*
Abe, Toshio; Takahashi, Seiichi; Kamihara, Masaharu; Saito, Hitoshi; Tanaka, Seizo; and Suzuki, Yasuyuki, 4,965,483, Cl. 310-324.000.
Tanaka, Kimio; and Shiba, Haruo, 4,965,690, Cl. 360-132.000.

Teach, Eugene G., to ICI Americas Inc. 5-oxy or thiomethyl substituted oxazolidine herbicide antidotes. 4,965,368, Cl. 548-215.000.

Tebbe, Frederick N.: *See—*
Watson, Patricia L.; and Tebbe, Frederick N., 4,965,386, Cl. 556-430.000.

Tecumseh Products Company: *See—*
Itameri-Kinter, Terry; Sauerbrey, David W.; and Troia, Victor, 4,964,788, Cl. 417-422.000.
Maertens, Michael J., 4,964,786, Cl. 417-363.000.
Tomell, Phillip A., 4,964,609, Cl. 248-638.000.

Teijin Chemicals, Ltd.: *See—*
Kishimoto, Kazuo, 4,965,303, Cl. 524-107.000.

Teijin Limited: *See—*
Inoue, Hideo; Ohtsuka, Eiko; Imura, Akihiro; Masuda, Kenichi; and Kamimura, Takashi, 4,965,350, Cl. 536-28.000.

Tejima, Shunichiro, to NEC Corporation. Receiving arrangement with a reception carrier frequency alternately changed from one to another. 4,965,851, Cl. 455-52.000.

Tektronix, Inc.: *See—*
Herrick, Geoffrey C., 4,965,514, Cl. 324-158.00P.
Yang, Kei-Wean C.; Taggart, John E.; Hayes, Raymond; and Peter, Joseph R., 4,965,648, Cl. 357-24.000.

Telecommunication Laboratories, Directorate General of Telecommunications, Ministry of Communications: *See—*
Jeng, Bor-Shenn; Chang, Gan-How; Chang, Kuang-Yao; Liu, Jaan-Shyong; Lin, Jangkeng; Hwang, Jei-Shoung; Wu, T-Min; Shyu, Keh-Hwa; Miou, Char-Hin; and Can, Luke, 4,965,458, Cl. 364-419.000.

Telecommunications Radio-electronics et Telephoniques T.R.T.: *See*—
Salle, Bertrand, 4,965,786, Cl. 370-32.100.
Temporin, Daniele: *See*—
Fantoni, Giuseppe; and Temporin, Daniele, 4,964,338, Cl. 101-378.000.
Tencor Instruments: *See*—
Fein, Michael E., 4,965,484, Cl. 313-15.000.
Tengler, John N.; Roath, Alan L.; and Venaleck, John T., to Minnesota Mining and Manufacturing Co. Shielded and grounded connector system for coaxial cables. 4,964,814, Cl. 439-607.000.
Tenhagen, Rudolf J.: *See*—
Lady, Werner A.; and Tenhagen, Rudolf J., 4,965,029, Cl. 264-45.100.
Tenryu Technics Co., Ltd.: *See*—
Fujioka, Teruhiko, 4,964,208, Cl. 29-568.000.
Terada, Masahiro: *See*—
Mikami, Koichi; Terada, Masahiro; Nakai, Takeshi; Sayo, Noboru; and Kumobayashi, Hidenori, 4,965,398, Cl. 560-60.000.
Terasawa, Koji: *See*—
Nagoshi, Shigeyasu; Terasawa, Koji; and Yamaguchi, Hideki, 4,965,596, Cl. 346-140.00R.
Terbrack, Ulrich: *See*—
Siol, Werner; and Terbrack, Ulrich, 4,965,783, Cl. 369-100.000.
Terrill, Conrad W.: *See*—
Bly, Vincent T.; Terrill, Conrad W.; and Advena, Donas J., 4,965,447, Cl. 250-233.000.
Terumo Corporation: *See*—
Seita, Yukio; and Emi, Makoto, 4,964,991, Cl. 210-500.360.
Terumo Kabushiki Kaisha: *See*—
Kitoh, Hideaki; Seita, Yukio; Koyama, Noriyuki; and Yokomachi, Shinsuke, 4,965,291, Cl. 521-64.000.
Sugiyama, Yoshiaki; and Sagae, Kyuta, 4,964,853, Cl. 604-96.000.
Terwilliger, Carl J. Tire holder. 4,964,552, Cl. 224-42.230.
Teuerstein, Avraham: *See*—
Georlette, Pierre; Goren, Hanoch; Shmilowitz, Shaul; and Teuerstein, Avraham, 4,965,021, Cl. 252-609.000.
Texaco Inc.: *See*—
Clausen, Glenn A.; Kuhn, Karen A.; and Weldon, Kathryn P., 4,964,974, Cl. 208-108.000.
Herbstman, Sheldon; and Virk, Kashmir S., 4,964,879, Cl. 44-434.000.
Schlicht, Raymond C., 4,965,003, Cl. 252-38.000.
Schlicht, Raymond C.; and Powers, William J., III, 4,965,004, Cl. 252-38.000.
Surles, Billy W., 4,964,465, Cl. 166-295.000.
Texas Instruments Incorporated: *See*—
Blake, Terence G. W., 4,965,213, Cl. 437-21.000.
Childers, Jimmie D.; and Norwood, Roger D., 4,965,474, Cl. 307-542.000.
Texstar, Inc.: *See*—
Webb, Roger M., 4,964,594, Cl. 244-131.000.
Th. Goldschmidt AG: *See*—
Ruf, Erich, 4,965,137, Cl. 428-432.000.
Thayer, Larry J.; and Coleman, Mark D., to Hewlett-Packard Company. Graphics system with programmable tile size and multiplexed pixel data and partial pixel addresses based on tile size. 4,965,751, Cl. 364-521.000.
Therma-Tru Corp.: *See*—
Thorn, John E., 4,965,030, Cl. 264-46.500.
Thoma, Paul E.; and Colla, Jeannine O., to Johnson Service Company. Capacitance humidity sensor. 4,965,698, Cl. 361-286.000.
Thomas, Anthony P. Multiple purpose furniture unit. 4,964,682, Cl. 312-138.100.
Thomas, Ronald W.: *See*—
Bozzo, Suzanna D.; and Thomas, Ronald W., 4,965,673, Cl. 358-335.000.
Thompson, Herbert E.; Rolph, Donald L.; Mercurio, Dominic; and Guerini, Albert J., to Syquest Technology. Removable cartridge disc drive with radial arm voice coil actuator. 4,965,685, Cl. 360-97.010.
Thompson, Ronald E.; and King, William P., to Mine Safety Appliances Company. Respirator filter means for removal of tritiated water. 4,964,900, Cl. 55-387.000.
Thomson CSF: *See*—
Coulmier, Jean-Pol; Lepere, Guy; and Kunegel, Jacques, 4,965,584, Cl. 342-159.000.
Lepere, Guy; Kunegel, Jacques; and Coulmier, Jean-Pol, 4,965,585, Cl. 342-160.000.
Murgue, Jean Pierre; Pressiai, Robert; and Robin, Leon, 4,964,723, Cl. 356-141.000.
Thor Technology Corporation: *See*—
Hink, Karl M.; and Polczynski, Mark H., 4,964,408, Cl. 128-633.000.
Thorn Emi plc: *See*—
Young, Donald C.; and Daniels, Philim B., 4,965,415, Cl. 200-83.00N.
Thorn, John E., to Therma-Tru Corp. Method of forming a compression molded door assembly. 4,965,030, Cl. 264-46.500.
Thorn, Richard P., to Lord Corporation. Damped extended-motion strut. 4,964,516, Cl. 267-140.100.
Thorn, Richard P., to Lord Corporation. Fluid filled resilient bushing. 4,964,623, Cl. 267-140.100.
Thornburgh, Scott: *See*—
McCoy, William F.; and Thornburgh, Scott, 4,965,377, Cl. 549-491.000.
Thottathil, John K., to E. R. Squibb & Sons, Inc. Resolution process for benzazepine intermediates. 4,965,356, Cl. 540-523.000.
Threatt, Gary S., to A.O. Smith Corporation. Water heater with heat trap in dip tube. 4,964,394, Cl. 126-361.000.
Timm, Walter C.; and McNally, Michael H., to Tarkett AB. Inlaid aggregate plastic floor tile. 4,965,299, Cl. 523-437.000.
Timossi, Gian Maria; Rossi, Giuseppina; and Dell'Orto, to Marelli Autronica S.p.A. Very-high-pressure transducer, particularly for detecting the pressure of a hydraulic fluid. 4,965,777, Cl. 367-140.000.
TiNi Alloy Company: *See*—
Johnson, Alfred D., 4,965,545, Cl. 337-140.000.
Tirado, Luis A., Jr.: *See*—
DelBiondo, Thomas, II; and Tirado, Luis A., Jr., 4,965,553, Cl. 340-573.000.
Titterington, Joseph B., to U.S. Philips Corporation. Semiconductor device having a laser printable envelope. 4,965,642, Cl. 357-72.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Funayama, Osamu; Arai, Mikiro; Nishii, Hayato; and Isoda, Takeshi, 4,965,058, Cl. 423-325.000.
Toda, Junji, to Vividstar International Inc. Dryer separater. 4,964,898, Cl. 55-337.000.
Todd, Joseph J.; Robinson, Earl F.; and Bare, Rex O., to Todd, Joseph J. Connector with recessed needle for Y-tube, and assembly. 4,964,855, Cl. 604-283.000.
Togashi, Fumihiko: *See*—
Hamaguchi, Koji; Togashi, Fumihiko; and Miyauchi, Yoshitaka, 4,964,949, Cl. 162-5.000.
Toho Titanium Co., Ltd.: *See*—
Kawahara, Haruyuki; Tanaka, Katsumi; Ashiura, Yasuyuki; and Yoshimura, Motonobu, 4,964,801, Cl. 433-173.000.
Tokuume, Takahiro, to NEC Corporation. Dynamic memory refresh circuit with a flexible refresh delay dynamic memory. 4,965,722, Cl. 364-200.000.
Tokyo Electric Co., Ltd.: *See*—
Murofushi, Harutoshi, 4,965,438, Cl. 235-384.000.
Nagai, Junshiro, 4,965,437, Cl. 235-381.000.
Tokyo Electron Limited: *See*—
Karasawa, Wataru, 4,965,515, Cl. 324-158.00R.
Tokyo Keiki Co., Ltd.: *See*—
Watanabe, Tsuneo; and Okada, Kouzou, 4,965,503, Cl. 318-671.000.
Tomell, Phillip A., to Tecumseh Products Company. Compressor mounting apparatus. 4,964,609, Cl. 248-638.000.
Tomida, Yasuko; and Koike, Shoji, to Canon Kabushiki Kaisha. Jet recording method using ink with viscosity of at least 2cp which is heated to lower the viscosity thereof to below 2cp before jetting. 4,965,609, Cl. 346-1.100.
Tonelli, Quentin J., to Idexx Corporation. Method and apparatus for assaying whole blood. 4,965,187, Cl. 435-5.000.
Tooman, Patrick A. Manifold assembly for plastic injection molding. 4,964,795, Cl. 425-144.000.
Tor, Yitzhak: *See*—
Sagiv, Jacob; Rubinstein, Israel; Steinberg, Suzi; Shanzer, Abraham; and Tor, Yitzhak, 4,964,972, Cl. 204-418.000.
Toray Industries, Inc.: *See*—
Okabe, Kazuo; Bokuta, Katsumi; and Morimoto, Hiroyuki, 4,965,307, Cl. 524-425.000.
Takada, Takashi; and Hirao, Kenichi, 4,964,913, Cl. 106-808.000.
Torigoe, Makoto, to Canon Kabushiki Kaisha. Exposure apparatus. 4,964,720, Cl. 353-122.000.
Tornay, Edmund G., to Energy Transportation Group, Inc. Apparatus and method for control of oil leakage from damaged tanker. 4,964,437, Cl. 137-1.000.
Tornberg, Claes, to Avesta Nyby Powder AB. Method of powder-metallurgical production of objects, specifically of tubes, rods, or the like. 4,965,043, Cl. 419-8.000.
Tornblom, Bengt H., to Tornbloms Kvalitetskonthol AB. Suppression of the effect of harmless surface defects in eddy current testing by sensitivity characteristic compensation. 4,965,519, Cl. 324-225.000.
Tornbloms Kvalitetskonthol AB: *See*—
Tornblom, Bengt H., 4,965,519, Cl. 324-225.000.
Torrance, Alstair C.: *See*—
Moxon, Neville T.; Torrance, Alstair C.; and Richardson, Stephen B., 4,964,329, Cl. 86-50.000.
Torriani, Diego: *See*—
Vasconi, Enrico; Mazzucchelli, Carlo; Torriani, Diego; and Giganti, Mario, 4,965,848, Cl. 388-815.000.
Torrielli, Vittorino: *See*—
Maggiosi, Virginio; and Torrielli, Vittorino, 4,964,612, Cl. 251-129.090.
Toshida, Yomishi: *See*—
Kurabayashi, Yutaka; Ohnishi, Toshikazu; Yoshinaga, Kazuo; Mouri, Akihiro; Isaka, Kazuo; Kaneko, Shuzo; Eguchi, Takeo; and Toshida, Yomishi, 4,965,591, Cl. 346-108.000.
Tosoh Corporation: *See*—
Saitoh, Hiroyuki; and Murakami, Tsugio, 4,965,016, Cl. 252-186.370.
Touhsaent, Robert E.: *See*—
Min, Taeik; and Touhsaent, Robert E., 4,965,130, Cl. 428-407.000.
Towsend, Marvin S., to Genvention, Inc. Automatic turntable for microwave oven. 4,965,425, Cl. 219-10.55F.
Toya, Hiroki: *See*—
Kimura, Hidetoshi; and Toya, Hiroki, 4,965,733, Cl. 364-474.090.
Toyo Boseki Kabushiki Kaisha: *See*—
Yamamoto, Kazumi; Kikuchi, Toshiro; and Emi, Shigenori, 4,965,194, Cl. 435-25.000.
Toyoda Gosei Co., Ltd.: *See*—
Omura, Masayuki; and Hamabata, Mitsuo, 4,964,620, Cl. 264-261.000.

Toyoda Koki Kabushiki Kaisha: *See—*
Abe, Ryutaro; Takeuchi, Yoshiyuki; and Shibata, Kouichi, 4,964,983, Cl. 210-168.000.
Toyofuku, Toshiyuki: *See—*
Yamasaki, Masafumi; Toyofuku, Toshiyuki; Itoh, Junichi; and Kodama, Shinichi, 4,965,443, Cl. 250-201.700.
Toyota Jidosha Kabushiki Kaisha: *See—*
Handa, Jun-ichi; Ito, Hiroshi; and Minohara, Taketoshi, 4,965,098, Cl. 428-203.000.
Kayanuma, Nobuaki, 4,964,272, Cl. 60-274.000.
Sawada, Hiroshi; Ueda, Tatehito; Nakanishi, Kiyoshi; and Demura, Takayuki, 4,964,271, Cl. 60-274.000.
Trabold, Peter: *See—*
Lufi, Gerhard; and Trabold, Peter, 4,965,234, Cl. 502-154.000.
Transpec, Inc.: *See—*
Lamparter, Ronald C., 4,964,673, Cl. 296-216.000.
Traulsen, Robert D.: *See—*
Parshotam, Mahesh; Howard, Alan D.; Traulsen, Robert D.; Pennock, James L.; Hoo, James W.; and Masten, Michael M., 4,965,516, Cl. 324-158.00R.
Travill, Andrew W., deceased: *See—*
Heybourne, Michael J. H.; Knight, Peter C.; Malguzzin, Antonio; Miotti, Daniele; and Travill, Andrew W., deceased, 4,965,015, Cl. 252-174.250.
Trbovich, Nick G.; and Campbell, Thomas D., to Racal Data Communications Inc. Key management for encrypted packet based networks. 4,965,804, Cl. 380-21.000.
Treff, Arthur J.: *See—*
Young, Paul R.; Richard, David W.; Treff, Arthur J.; and Staehly, Christopher E., 4,965,686, Cl. 360-98.070.
Treiber, Richard K.: *See—*
Shoens, Kurt A.; and Treiber, Richard K., 4,965,719, Cl. 364-200.000.
Tremulis, William S., to Advanced Cardiovascular Systems, Inc. Flexible hollow guiding member with means for fluid communication therethrough. 4,964,409, Cl. 128-657.000.
Trenary, Dale T., to General Signal Corporation. Probe card for integrated circuit chip. 4,965,865, Cl. 324-158.00P.
Trew, Timothy I. P.; and Vreeswijk, Franciscus W. P., to U.S. Philips Corporation. Method and apparatus for processing signals conveyed in sub-sampled form by way of a transmission channel or record carrier. 4,965,667, Cl. 358-138.000.
Trinity Industries, Inc.: *See—*
Long, Russell L.; and Hart, James D., 4,964,347, Cl. 105-404.000.
Trittler, Karl: *See—*
Helbig, Roland; and Trittler, Karl, 4,964,424, Cl. 137-557.000.
Troia, Victor: *See—*
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Trojahn, Hans-Georg: *See—*
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Trout, Torence J.: *See—*
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Truswall Systems Corporation: *See—*
Schofield, Paul J.; and Goheen, Leo A., 4,965,740, Cl. 364-512.000.
Tschoeke, Helmut: *See—*
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Tsubakimoto Chain Co.: *See—*
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Morikiyo, Akira; Morimoto, Ryuji; and Yamahata, Misao, 4,964,499, Cl. 198-365.000.
Wakita, Yuji; and Haruna, Hideaki, 4,964,776, Cl. 414-277.000.
Tsuchida, Masami; Miyake, Ichiro; Takahashi, Tokihiro; Wakumura, Shinichi; Iso, Yoshimi; Arai, Takao; and Okamoto, Hiroo, to Pioneer Electronic Corporation; and Hitachi, Ltd. Offset compensation circuit. 4,965,867, Cl. 341-118.000.
Tsuchimoto, Shuhei: *See—*
Kurokawa, Makoto; Shimoda, Yoshihide; and Tsuchimoto, Shuhei, 4,964,366, Cl. 118-429.000.
Tsuda, Masaaki, to Kabushiki Kaisha Takara. Adhesive tape applicator. 4,964,942, Cl. 156-468.000.
Tsuge, Kazunori: *See—*
Yamagishi, Hideo; Nevin, William A.; Nishio, Hitoshi; Miki, Keiko; Tsuge, Kazunori; and Tawada, Yoshihisa, 4,965,225, Cl. 437-173.000.
Tsuji, Shintaro, to Sanrio Company, Ltd. Automobile shaped miniature radio set. 4,965,855, Cl. 455-344.000.
Tsujita, Kenji: *See—*
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Tsukada, Isao: *See—*
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Tsukahara, Kengo; Otake, Takeshi; Saito, Masao; and Koseki, Toshio, to Mitsubishi Gas Chemical Company, Inc. Process for producing hydrogen cyanide and appartus for use in the process. 4,965,060, Cl. 423-376.000.
Tsunekawa, Satoru: *See—*
Mano, Hiroyuki; Kinugawa, Kiyoshige; and Tsunekawa, Satoru, 4,965,563, Cl. 340-784.000.
Tsunemi, Shinichiro: *See—*
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Tsutsumi, Kentaro: *See—*
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Tucker, Edward B.; and Biel, Edward N., to First Brands Corporation. Low temperature impact and puncture resistant polypropyene films layered films and bags therefrom. 4,965,109, Cl. 428-35.700.
Tucker, Edward B.: *See—*
Biel, Edward N.; and Tucker, Edward B., 4,965,108, Cl. 428-35.700.
Tucker, Larry C. Heavy duty mud flap. 4,964,655, Cl. 280-851.000.
Tucker, Richard B. C., to Wm. T. Burnett & Co., Inc. Golf putter. 4,964,639, Cl. 273-164.000.
Tuero, Lucia S.: *See—*
Sanfeliu, Amparo S.; Tuero, Lucia S.; Delgado de Molina Gonzalez, Maria J.; and Vinas, Antonio B., 4,965,365, Cl. 548-109.000.
Tupitsyn, Konstantin K.; Tupitsyn, Sergei; Kamensky, Veniamin; and Jurievich, Kiselev N. Pneumatic percussive device. 4,964,477, Cl. 175-296.000.
Tupitsyn, Sergei: *See—*
Tupitsyn, Konstantin K.; Tupitsyn, Sergei; Kamensky, Veniamin; and Jurievich, Kiselev N., 4,964,477, Cl. 175-296.000.
Turbulence Prediction Systems: *See—*
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Tutt, Timothy: *See—*
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Tuziemski, Aleksander: *See—*
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UBE Industries, Ltd.: *See—*
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Ubelacker, Horst; Storch, Helmut; and Buchwald, Peter, to Integram Inc. Installation for deep-drawing and back-foaming of upholstery covers. 4,964,794, Cl. 425-117.000.
Uchida, Manabu; Yoshida, Naoyuki; and Kaneoya, Masakazu, to Chisso Corporation. Optically active pyridylethanol derivative. 4,965,018, Cl. 252-299.610.
Uchida, Yoshitaka; Hamatsu, Masahiro; and Mori, Masaharu, to Clarion Co., Ltd. Spread-spectrum receiver. 4,965,759, Cl. 364-604.000.
Uchikawa, Tadao: *See—*
Ohnishi, Osamu; Takahashi, Sadayuki; Myohga, Osamu; Uchikawa, Tadao; Inoue, Takeshi; Kagaya, Isao; and Ueha, Sadayuki, 4,965,482, Cl. 310-323.000.
Uchimoto, Mari: *See—*
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Udagawa, Yoshiro; and Takiguchi, Hideo, to Canon Kabushiki Kaisha. Color image signal processing method and apparatus for recording a color image from input color image signals by converting an individual color signal component. 4,965,664, Cl. 358-80.000.
Udo, Eiji, to Nikko Industry Co., Ltd. Combination aiding apparatus for steel-making electric-arc-furnace. 4,965,813, Cl. 373-2.000.
Ueda, Masashi: *See—*
Sakakibara, Kenji; Ueda, Masashi; Ishikawa, Shigeki; Sakai, Jun; and Izaki, Takeshi, 4,965,625, Cl. 355-35.000.
Ueda, Shigeta; Honda, Kazuo; Ikimi, Takashi; Matsuda, Toshihiko; Nagase, Hiroshi; and Mutoh, Nobuyoshi, to Hitachi, Ltd. Control apparatus for inverter for driving AC motor. 4,965,504, Cl. 318-802.000.
Ueda, Tatehito: *See—*
Sawada, Hiroshi; Ueda, Tatehito; Nakanishi, Kiyoshi; and Demura, Takayuki, 4,964,271, Cl. 60-274.000.
Ueha, Sadayuki: *See—*
Ohnishi, Osamu; Takahashi, Sadayuki; Myohga, Osamu; Uchikawa, Tadao; Inoue, Takeshi; Kagaya, Isao; and Ueha, Sadayuki, 4,965,482, Cl. 310-323.000.
Ueyama, Satoshi; and Isoda, Satoru, to Kozo Iizuka, Director General, Agency of Industrial Science and Technology. Modifying agent for conductive substrate. 4,965,133, Cl. 428-411.100.
Ugawa, Satoru: *See—*
Nishijima, Hirotaka; and Ugawa, Satoru, 4,964,238, Cl. 49-352.000.
Ukai, Toshinao; Shirasu, Kazuhiro; Nakamura, Koki; Koya, Keizo; Okada, Masahiro; and Katoh, Kazunobu, to Fuji Photo Film Co., Ltd. Silver halide photographic material and method for forming super high contrast images therewith. 4,965,170, Cl. 430-264.000.
Ulich, Bobby L.; Calmes, Lonnie K.; and Elkins, William P., to Kaman Aerospace Corporation. Imaging lidar system. 4,964,721, Cl. 356-5.000.
Umetsu, Yukihide; Hasegawa, Hideo; Takahashi, Toshio; and Miyagawa, Masayuki, to Mitsubishi Plastics Industries Limited; and Kikkoman Corporation. Thermoplastic blown bottle with a handle. 4,964,522, Cl. 215-100.00A.
Umise, Shigeki: *See—*
Mizobuchi, Akira; Hida, Yoshiaki; Umise, Shigeki; Yamamoto, Kyoichi; and Takahashi, Kyohei, 4,965,132, Cl. 428-411.100.
Unemoto, Kazuo: *See—*
Saki, Yosinori; Kotera, Hiroshi; Unemoto, Kazuo; Arikawa, Tomohiko; Jung, Wayne; Tutt, Timothy; and Dunk, Mike, 4,965,558, Cl. 340-712.000.
Unilever Patent Holdings B.V.: *See—*
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Union Carbide Industrial Gases Technology Corporation: *See*—
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Barham, Steven T.; and Hurst, Michael J., 4,965,830, Cl. 381-31.000.
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United Floorcare Systems, Inc.: *See*—
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U. S. Competition Arms, Inc.: *See*—
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United States of America
Air Force: *See*—
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Army: *See*—
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Skudera, William J., Jr.; and Albert, Stuart D., 4,965,581, Cl. 342-19.000.
Wichansky, Howard, 4,964,689, Cl. 350-96.210.
Commerce: *See*—
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Energy: *See*—
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National Aeronautics and Space Administration: *See*—
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Kinard, William H.; Singer, S. Fred; Wortman, Jim J.; Humes, Donald H.; Kassel, Philip C., Jr.; and Stanley, John E., deceased, 4,964,300, Cl. 73-170.00R.
Malin, Jane T.; Basham, Bryan D.; and Harris, Richard A., 4,965,743, Cl. 364-513.000.
Schmidt, Deborah D.; Alter, Wendy S.; and Hamilton, William D., 4,964,453, Cl. 164-122.100.
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National Aeronautics and Space Adminstration: *See*—
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Navy: *See*—
Dombrowski, James H.; Mummery, Herbert L.; Buecher, Roger W.; and Yumori, Isao R., 4,964,491, Cl. 188-299.000.
Esterowitz, Leon; and Stoneman, Robert C., 4,965,803, Cl. 372-5.000.
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Kabacoff, Lawrence T.; and Ferrando, William, 4,965,139, Cl. 428-682.000.
Miller, Harry B., 4,965,834, Cl. 381-94.000.
Mueller, William J., 4,965,776, Cl. 367-126.000.
Nordquist, Paul E. R., Jr.; and Singer, Arnold H., 4,965,055, Cl. 423-492.000.
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U.S. Philips Corporation: *See*—
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Freeman, Kenneth G., 4,965,487, Cl. 313-422.000.
Gartner, Georg F.; Jamiel, Peter A.; and Lydtin, Hans-Jurgen, 4,965,090, Cl. 427-39.000.
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Trew, Timothy I. P.; and Vreeswijk, Franciscus W. P., 4,965,667, Cl. 358-138.000.
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United Technologies Corporation: *See*—
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University of California, The Regents of the: *See*—
Casida, John E.; Palmer, Christopher J.; Larkin, John P.; and Smith, Ian H., 4,965,257, Cl. 514-149.000.
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University of Iowa Research Foundation: *See*—
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University of Liverpool, The: *See*—
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University of Minnesota, Regents of the: *See*—
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University of Virginia: *See*—
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University of Virginia Alumini Patents: *See*—
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University of Washington, The Board of Regents of The: *See*—
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Uno, Hitoshi; Kon, Tatsuya; Nishikawa, Yoshinori; Shindo, Tokuhiko; Nakamura, Hideo; and Ishii, Katsumi, to Dainippon Pharmaceutical Co., Ltd. Heteroarylcarboxamide derivatives, process for preparing the same and pharmaceutical composition containing the same. 4,965,266, Cl. 514-253.000.
UOP: *See*—
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Usami, Toshimasa: *See*—
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Ushida, Kazuo: *See*—
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Ushifusa, Nobuyuki: *See*—
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Usui Kokusai Sangyo Kaisha Ltd.: *See*—
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Usui, Masayoshi; Washizu, Katsushi; and Takikawa, Kazunori, 4,964,658, Cl. 285-319.000.
Usui, Masayoshi; Washizu, Katsushi; and Takikawa, Kazunori, to Usui Kokusai Sangyo Kaisha Ltd. Small-size piping coupling joint. 4,964,658, Cl. 285-319.000.
Usui, Minoru: *See*—
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Usui, Tetuo: *See*—
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Utsumi, Isao; and Mori, Yoshikazu, to Oki Electric Industry Co., Ltd. Compiler system using reordering of microoperations to eliminate interlocked instructions for pipelined processing of assembler source program. 4,965,724, Cl. 364-200.000.
Uzawa, Shunichi: *See*—
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Valco Cincinnati, Inc.: *See*—
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Valmet Paper Machinery Inc.: *See*—
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Van Dale, Inc.: *See*—
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Van Bogaert, Philippe; Moenecleey, Denis; and Lagache, Remi, to Picanol N.V. Weft mixer. 4,964,443, Cl. 139-453.000.
Van Breen, Adriaan W.: *See*—
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Van Buuren, Tony: *See*—
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Vandegriff, Joseph W.: *See*—
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Van de Mortel, Petrus P.: *See*—
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Vandenberg, Edwin J.; and Mullis, Jeffrey C., to Arizona Board of Regents, acting on behalf of Arizona State University. High molecular weight polymers and copolymers of 3-hydroxyoxetane and derivatives thereof. 4,965,342, Cl. 528-417.000.
Vanderheyden, Herman. Volumetric dosing apparatus. 4,964,784, Cl. 417-86.000.
VanderHeyden, Jean-Luc: *See*—
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Vanderlans, Gerald J. Pipe plug with circumferential suction cups. 4,964,439, Cl. 138-93.000.

Van Dijk, Christiaan P.; and Fraley, Lowell D., to Brudike Corporation. Hydrogen sulfide removal and sulfide recovery. 4,965,062, Cl. 423-576.700.

Van Doorn, Johannes A.; and Drent, Eit, to Shell Oil Company. Polymerization of co/olefin with catalyst comprising sulfur bidentate ligand. 4,965,341, Cl. 528-392.000.

van Dorsselaer, Etienne L. M. E., to OCE Nederland B.V. Method and apparatus for coding digital image information obtained from dithering. 4,965,843, Cl. 382-50.000.

Van Hoogstrate, John A.; and Buchroeder, Richard A., to McDonnell Douglas Corporation. Optical corrector. 4,964,718, Cl. 353-31.000.

Van Leeuwen, Hendrikus J.; Freeman, Norman H.; Sutherland, Brian J.; and Jameson, Graeme W., to Commonwealth of Australia. Preparation of hard cheese from concentrated milk. 4,965,078, Cl. 424-40.000.

Van Meurs, Johannes M.; and Hendrix, Machiel A. M., to U.S. Philips Corporation. Electric arrangement for igniting and supplying a gas discharge lamp. 4,965,493, Cl. 315-224.000.

Van Roermund, Arthur H. M.: *See*—
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Varde, Uday: *See*—
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Varian Associates, Inc.: *See*—
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Varner, Christopher C.: *See*—
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Varta Batterie Aktiengesellschaft: *See*—
Ruggeberg, Klaus; and Jose, Horst-Udo, 4,965,105, Cl. 428-34.200.

Vasconi, Enrico; Mazzucchelli, Carlo; Torriani, Diego; and Giganti, Mario, to Whirlpool International B.V. Control circuit for a permanent magnet or constant excitation direct current motor, particularly for washing machines. 4,965,848, Cl. 388-815.000.

Vasudev, Prahalad K. MOS-enhanced, self-aligned lateral bipolar transistor made of a semiconductor on an insulator. 4,965,872, Cl. 357-35.000.

Vaughan, David E. W., to Exxon Research & Engineering Company. High silica faujasite aluminosilicate, ECR-4, and a process for making it. 4,965,059, Cl. 423-328.000.

Veach, Jack R.; and Helleksen, Alden C., to Arctic Fox Heaters. Device for bypassing heat exchange conduits. 4,964,376, Cl. 123-557.000.

Vehar, Gordon A.: *See*—
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Vehlewald, Peter: *See*—
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Veit GmbH & Co.: *See*—
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Velazques, Diosie: *See*—
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Venaleck, John T.: *See*—
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Ventritex, Inc.: *See*—
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Verhoeven, Jeroen J.: *See*—
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Verhulst, Antonius G. H., to U.S. Philips Corporation. Electroscopic display device. 4,965,562, Cl. 340-783.000.

Versa Medical Technologies, Inc.: *See*—
Ball, Robert C.; and German, Paul G., 4,964,368, Cl. 119-14.490.

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Vicari, Richard; Aslam, Mohammad; Ray, Wilson B.; Davenport, Kenneth G.; Dammel, Ralph; Lingnau, Juergen; and Doessel, Karl-Friedrich. Preparation of 3,5-disubstituted-4-acetoxystyrene. 4,965,400, Cl. 560-130.000.

VideoTelecom Corp.: *See*—
Wil[illegible]ms, Errol R., 4,965,822, Cl. 379-390.000.

Viking Pump Inc.: *See*—
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Vinas, Antonio B.: *See*—
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Vincent, Michel; Remond, Georges; and Cudennec, Claude, to Adir ET CIE. Peptide compounds having a nitrogenous polycyclic structure. 4,965,250, Cl. 514-18.000.

Vincze, Bela: *See*—
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Vinluan, Relan N.: *See*—
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Virtanen, Olli, to Oy Lohja AB. Shotcrete gun. 4,964,731, Cl. 366-11.000.

Vividstar International Inc.: *See*—
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VLSI Technology, Inc.: *See*—
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Voecks, Gerald E.: *See*—
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Voigtlander, Volkmar: *See*—
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Volz, Peter: *See*—
Burgdorf, Jochen; Reinartz, Hans-Dieter; Steffes, Helmut; Von Hayn, Holger; Volz, Peter; Wupper, Hans; Buschmann, Gunther; Beck, Erhard; Dehio, Gottfried; Dinkel, Dieter; and Rausch, Juergen, 4,964,681, Cl. 303-116.000.

Von Basse, Paul-Werner; Dortu, Jean-Marc; Herlitzek, Andrea; Kohlert, Dieter; and Schaper, Ulrich, to Siemens Aktiengesellschaft. Power amplifier circuit for integrated digital circuits. 4,965,464, Cl. 307-270.000.

Von Brandt, Kim; Blakeslee, Bruce L.; Keil, John, Jr.; and Stroud, Robert D., to Storage Technology Corporation. Apparatus for mounting a magnetic head on a suspension arm. 4,964,941, Cl. 156-360.000.

Von Hayn, Holger: *See*—
Burgdorf, Jochen; Reinartz, Hans-Dieter; Steffes, Helmut; Von Hayn, Holger; Volz, Peter; Wupper, Hans; Buschmann, Gunther; Beck, Erhard; Dehio, Gottfried; Dinkel, Dieter; and Rausch, Juergen, 4,964,681, Cl. 303-116.000.

Vonsacken, Ulrich: *See*—
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Vossmerbaumer, Rudolf: *See*—
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W. Gunther GmbH: *See*—
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W. L. Gore & Associates, Inc.: *See*—
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W. P. Hickman Company: *See*—
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W. Schlafhorst & Co.: *See*—
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Wagatsuma, Yuki; and Kanno, Hiroshi, to Ricoh Company, Ltd. Apparatus for erasing and extracting image data from particular region of orignal document. 4,965,744, Cl. 364-518.000.

Wagner, Christopher S. Detachable bulletproof vest air conditioning apparatus. 4,964,282, Cl. 62-259.300.

Wagner, Hans. Magnetic device. 4,964,830, Cl. 446-71.000.

Wagner, Hans-Dieter: *See*—
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Wagoner, Patrick K. Removable and adjustable divider for coolers. 4,964,528, Cl. 220-22.300.

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Waldherr, Arthur. Dual metal clip. 4,964,225, Cl. 33-768.000.
Walker, Louis L.: *See*—
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Wang, Chia-Lin J.; and Wuonola, Mark A., to Du Pont de Nemours, E. I., and Company. Aminomethyl oxooxazolidinyl cycloalkylbenzene derivatives useful as antibacterial agents. 4,965,268, Cl. 514-253.000.
Wang, Hwa-Chi: *See*—
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Watanabe, Masayoshi; and Noda, Seiichi, to NEC Corporation. Error correcting system capable of effectively using an allowable frequency band. 4,965,576, Cl. 341-94.000.
Watanabe, Namio, to Akebono Brake Industry Co., Ltd.; and Akebono Research and Development Centre Ltd. Pin type disc brake. 4,964,490, Cl. 188-73.440.
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Watts, Leonard A.; and Espinosa, Medardo, to EDS Technologies, Inc. Apparatus and method for forming signatures into a V-configuration. 4,964,627, Cl. 271-188.000.
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Weaver, William R.; and Matzinger, James E., to Libbey-Owens-Ford Co. Method of molding a composite. 4,965,037, Cl. 264-511.000.
Webb, A. LeVan; and Webb, Margaret. Device for supporting a mechanic in a horizontal position above an automotive vehicle engine compartment. 4,964,487, Cl. 182-82.000.
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Weber, Abraham; Bouzard, Daniel; Easiz, Munir; Di Cesare, Pierre; Jacquet, Jean-Pierre; and Remuzon, Philippe, to Bristol-Myers Company. Certain 1-tertiary-butyl-naphthyridone carboxylic acid derivatives anti-bacterial agents. 4,965,273, Cl. 514-300.000.
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Weissert, Wolfgang: *See*—
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Welsh, Norman C.; and Oglesby, Oliver D., to Gillette Company, The. Flexible safety razors. 4,964,214, Cl. 30-49.000.
Welty, Ronald S., to Welty, Ronald S. Air duct plug. 4,964,438, Cl. 138-89.000.
Welzel, Josef, to Herman Hemscheidt Maschinenfrabrik GmbH & Co. Method of electro-hydraulic control of longwall mine units. 4,964,675, Cl. 299-1.000.
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Wen, Horng-Yuan; Wang, Hwa-Chi; and Chesters, Stephen, to American Air Liquide. Method of separating condensible vapors from particles in highly compressed gases. 4,964,278, Cl. 62-55.500.
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Wernett, Frederick C.: *See*—
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West, James E.: *See*—
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Westinghouse Electric Corp: *See*—
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Westinghouse Electric Corp.: *See*—
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Westlund, Arnold E., Jr.; Boyd, John M.; and Fleming, Raymond T., to GTE Products Corporation. Internal lamp reflector. 4,964,829, Cl. 445-22.000.
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Whalen, Greg R., to GTE Products Corporation. Vibration suppressing headlamp clip. 4,965,703, Cl. 362-61.000.
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White, R. Kent. Pilot enhanced/amplitude equalized impulse magnetic. 4,965,873, Cl. 360-41.000.
Whitear, Frank W. Lotion applicator with rewinding spool. 4,964,744, Cl. 401-6.000.
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Wieder, Irwin; and Wollenberg, Robert H., to Wieder, Irwin. Fluorometric analysis method. 4,965,211, Cl. 436-543.000.
Wieland, Gerhard; Steckenreuter, Klaus; Gernand, Wolfgang; and Simgen, Helmut, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Ampuls and apparatus thereon for opening same. 4,964,521, Cl. 215-32.000.
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Wieman, Martha; and Wieman, Mark. Plow disc blade decorative article. 4,964,928, Cl. 148-9.00R.
Wieser-Linhart, Johannes, to Hydrotechnik GmbH. Method of cleaning exhaust gas of drying plants and an apparatus for implementing such method. 4,964,885, Cl. 55-8.000.
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Wilkes, Donald F. Device for converting rotary motion to linear motion. 4,964,314, Cl. 74-424.80C.
Wilkins, Mark L.; and Wong, Alvin O., to BR Communications, Inc. Antenna coupler. 4,965,607, Cl. 343-861.000.
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Williams, Arthur C., to Williams, Booth & Stewart. Ceiling system. 4,964,255, Cl. 52-489.000.
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Williams, Dennis A.; Newlove, John C.; and Horton, Roger L., to Exxon Chemicals Patents Inc. Hydraulic fracturing with chlorine dioxide cleanup. 4,964,466, Cl. 166-300.000.
Williams, Errol K., to VideoTelecom Corp. Full duplex speakerphone. 4,965,822, Cl. 379-390.000.
Williams, Tim A., to Motorola Inc. Mixed size radix recoded multiplier. 4,965,762, Cl. 364-760.000.
Williamson, Warren P., IV, to Baxter International Inc. Pivot pin bearing/seal with loose eyelet especially suited for disposable continuous flow blood filtration system cartridges. 4,965,846, Cl. 384-138.000.
Willis, Robert J., Jr., to General Electric Company. Transmission having dual counterrotating output shafts. 4,964,315, Cl. 74-665.0GA.
Wills, David C.: *See*—
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Wilmot, Donald W.; and Taylor, Robert T., to QuesTech, Inc. Projectile having nonelectric infrared heat tracking device. 4,964,591, Cl. 244-3.160.
Wilson Greatbatch Ltd.: *See*—
Keister, Pamela P.; Mead, Ralph T.; Muffoletto, Barry C.; Takeuchi, Esther S.; Ebel, Steven J.; Zelinsky, Michael A.; and Greenwood, John M., 4,964,877, Cl. 29-623.100.
Wilson, Maximilian J. Collapsible cervical immobilization device. 4,964,418, Cl. 128-857.000.
Wilson, William. Receptacle for collecting and bundling newspapers. 4,964,518, Cl. 211-50.000.
Win, Maug H.: *See*—
Potts, David C.; Win, Maug H.; and Garvey, Lee P., 4,965,000, Cl. 252-8.750.
Winchell, Michael A.; and Steele, Robin L., to NCR Corporation. Method for providing an improved human user interface to a knowledge based system. 4,965,741, Cl. 364-513.000.
Windham, Danny: *See*—
Blackwell, Steven R.; Polge, Steve; Windham, Danny; and Bruce, Melvin, 4,965,641, Cl. 375-7.000.
Winkler, Carol A.: *See*—
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Winter, Hermann: *See*—
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Wisneski, Leonard J., Jr.; and Lindhard, Gordon, to Snap-on Tools Corporation. Capacitor charging circuit for timing light power source. 4,965,494, Cl. 315-241.00S.
Woesner, Michael A.: *See*—
Pearman, Arthur N. J.; and Woesner, Michael A., 4,965,756, Cl. 364-571.010.
Wohlleben, Wolfgang: *See*—
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Wohner, Gerhard: *See*—
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Wolf-Gerate GmbH: *See*—
Kolb, Walter, 4,964,266, Cl. 56-202.000.
Wolfbeis, Otto; Kroneis, Herbert; and Offenbacher, Helmut, to AVL AG. Method of making a sensor element for fluorescence-optical measurements. 4,965,087, Cl. 427-2.000.
Wolfe, Jesse D.: *See*—
Young, Paul I.; and Wolfe, Jesse D., 4,965,121, Cl. 428-213.000.
Wolff, Gustave F. Collector edition doll. 4,964,831, Cl. 446-75.000.
Wollenberg, Robert H.: *See*—
Wieder, Irwin; and Wollenberg, Robert H., 4,965,211, Cl. 436-543.000.
Wollweber, Detlef; Kramer, Wolfgang; Dutzmann, Stefan; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Pesticidal pyridine-4-carboxylic acid anilides. 4,965,275, Cl. 514-354.000.
Wollweber, Detlef, to Bayer Aktiengesellschaft. Process for the preparation of 3-cyano-4-aryl-pyrroles. 4,965,363, Cl. 548-561.000.
Wong, Alvin O.: *See*—
Wilkins, Mark L.; and Wong, Alvin O., 4,965,607, Cl. 343-861.000.
Wong, Kwok-Ping; and Davis, Glenn R., to Otis Engineering Corporation. Manual blowout preventer with invertible rams. 4,964,610, Cl. 251-1.300.
Wong, Mon N.; and Kroupa, Gregory D., to Hughes Aircraft Company. Electromagnetic polarization selector. 4,965,568, Cl. 343-756.000.
Wong, Mon N.: *See*—
Chang, Donald C.; Wong, Mon N.; Patin, Robert J.; and Chang, Stanley S., 4,965,605, Cl. 343-700.0MS.
Woo, Sam L.; Menchen, Steven M.; and Fung, Steven, to Applied Biosystems, Inc. Method of synthesizing oligonucleotides labeled with ammonia-labile groups on solid phase supports. 4,965,349, Cl. 536-27.000.
Woo, Savio L. C.; and Dilella, Anthony G., to Howard Hughes Medical Institute. Methods for the identification of mutations in the human phenylalanine hydroxylase gene using DNA probes. 4,965,190, Cl. 435-6.000.
Wood, Geoffrey A., to British Nuclear Fuels plc. Production of ceramic nuclear fuel pellets. 4,965,024, Cl. 264-0.500.
Wood, James. Mailbox signalling system which is visible at night and in daylight. 4,964,565, Cl. 232-35.000.

Wood, John E.: *See*—
Jacobsen, Stephen C.; and Wood, John E., 4,964,306, Cl. 73-763.000.
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Wood, Robert D.: *See*—
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Wood, Ronald C., Jr.: *See*—
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Wood, William I.: *See*—
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Worrell, J. Robert: *See*—
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Wright, Jerry F. Karate kick exercise apparatus. 4,964,629, Cl. 272-76.000.
Wright, Kenneth W.: *See*—
Neal, Donald F.; Kearns, Michael W.; Fox, Stephen P.; Melville, James E.; Wright, Kenneth W.; Wood, Philip S.; Pinder, John T.; and Clark, Stephen C., 4,964,564, Cl. 228-107.000.
Wrobel, Avi; Lodhie, Qamar; and Rafique, Sajid. Removable panel illuminating module. 4,965,457, Cl. 362-249.000.
Wroblewski, Thomas R., to Chrysler Corporation. Automatic wake-up circuit arrangement for a single wire multiplex switch monitoring system. 4,965,550, Cl. 340-524.000.
Wu, Hans. Apparatus for cracking a melon seed. 4,964,215, Cl. 30-120.100.
Wu, T-Min: *See*—
Jeng, Bor-Shenn; Chang, Gan-How; Chang, Kuang-Yao; Liu, Jsann-Shyong; Lin, Jangkeng; Hwang, Jei-Shoung; Wu, T-Min; Shyu, Keh-Hwa; Miou, Char-Hin; and Can, Luke, 4,965,458, Cl. 364-419.000.
Wully S.A.: *See*—
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Wyatt, James L., to Ambassador Industries. Carrier and replaceable cartridge hanger assembly. 4,964,191, Cl. 16-87.200.
Wyatt, Paul G.: *See*—
Harnden, Michael R.; Wyatt, Paul G.; and Bailey, Stuart, 4,965,270, Cl. 514-262.000.
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Xerox Corporation: *See*—
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Yair, John, to Imbiex (Monmouth) Limited. Mounting. 4,964,603, Cl. 248-230.000.
Yalon, Moshe: *See*—
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Yamada, Masanori, to Canon Kabushiki Kaisha. Area designation apparatus in image processing system. 4,965,678, Cl. 358-452.000.
Yamada, Naoki: *See*—
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Yamada, Osamu: *See*—
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Yamada, Teiji; and Funabiki, Masaki, to Engelhard Corporation. Process for producing a catalyst for purifying exhaust gases from internal combustion engines. 4,965,243, Cl. 502-304.000.
Yamada, Yukio: *See*—
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Yamagata, Shigeo: *See*—
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Yamagishi, Hideo; Nevin, William A.; Nishio, Hitoshi; Miki, Keiko; Tsuge, Kazunori; and Tawada, Yoshihisa, to Kanegafuchi Chemical Industry Co., Ltd. Method of stabilizing amorphous semiconductors. 4,965,225, Cl. 437-173.000.
Yamagishi, Makoto: *See*—
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Yamagiwa, Masataka; and Yamada, Naoki, to Aisin Seiki Kabushiki Kaisha. Vehicle height control system. 4,965,878, Cl. 364-424.050.
Yamaguchi, Hideki: *See*—
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Yamamoto, Kazumi; Kikuchi, Toshiro; and Emi, Shigenori, to Toyo Boseki Kabushiki Kaisha. Pyruvate oxidase and an analytical method using the same. 4,965,194, Cl. 435-25.000.
Yamamoto, Kyoichi: *See*—
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Yamane, Kazuo; and Shimasue, Masanori, to Fujitsu Limited. Parallel-to-serial converter. 4,965,797, Cl. 370-112.000.
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Yamanouchi, Junichi: *See*—
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Yamasaki, Masafumi; Toyofuku, Toshiyuki; Itoh, Junichi; and Kodama, Shinichi, to Olympus Optical Co., Ltd. Focus detection apparatus using neural network means. 4,965,443, Cl. 250-201.700.

Yamasaki, Masahiko; and Nagai, Yoshitaka, to Konica Corporation. Monoclonal antibody and method of manufacturing hybridoma producing the same. 4,965,198, Cl. 435-70.210.

Yamashita, Katsuji: *See*—
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Yamauchi, Masaaki: *See*—
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Yamauchi, Toshihiko; and Akiyama, Nobuyuki, to Hitachi, Ltd. Method and apparatus for detecting foreign particle. 4,965,454, Cl. 250-372.000.

Yamaura, Tamotsu; Yamaoka, Fumiyuki; and Sasaki, Mitsuo, to Atsugi Motor Parts Company, Limited. Shock absorber with variable damping characteristics depending upon stroke speed. 4,964,493, Cl. 188-322.150.

Yamazaki, Shigeru, to Ricoh Company, Ltd. Image printing apparatus. 4,965,590, Cl. 346-108.000.

Yamazaki, Shohei, to Yamaha Corporation. Magnetic recording and reproduction device with fast feed/rewind head to tape speed control. 4,965,874, Cl. 360-70.000.

Yanagihara, Manabu: *See*—
Inada, Masanori; Eda, Kazuo; Ota, Yorito; Nakagawa, Atsushi; and Yanagihara, Manabu, 4,965,650, Cl. 357-34.000.

Yanagisawa, Kasumasa, to Hitachi, Ltd. Semiconductor memory capable of simultaneously reading plural adjacent memory cells. 4,965,770, Cl. 365-238.500.

Yanaki, Toshio; Maehata, Shigeki; Satoh, Tomoko; and Ikeda, Shinji, to Taito Company, Ltd. Process for producing a condensed polysaccharide. 4,965,354, Cl. 536-124.000.

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Yang, Kei-Wean C.; Taggart, John E.; Hayes, Raymond; and Peter, Joseph R., to Tektronix, Inc. Tilted channel, serial-parallel-serial, charge-coupled device. 4,965,648, Cl. 357-24.000.

Yano, Koji: *See*—
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Yarita, Yoshio; and Kawamura, Yoshihiro, to Casio Computer Co., Ltd. Method of manufacturing double-sided wiring substrate. 4,964,947, Cl. 156-645.000.

Yaskawa Electric Mfg. Co. Ltd.: *See*—
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Yasuda, Tomokazu: *See*—
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Yissum Research Development Company of the Hebrew University of Jerusalem: *See*—
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Ylvisaker, Jon A.; and Boston, Louis R., to Borden, Inc. Form-fill-seal deflation method and apparatus. 4,964,259, Cl. 53-433.000.

Yokoe, Masaaki; Kurono, Yoshikazu; Hayashi, Koji; Takagi, Tomoe; Matsushita, Narihiro; and Takagi, Yuzo, to Brother Kogyo Kabushiki Kaisha. Embroidery data processing system for automatic sewing machine. 4,964,352, Cl. 112-103.000.

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Yokota, Takashi, to Kabushiki Kaisha Yokota. Electrically operated system for drawing curtains and other types of barriers. 4,965,498, Cl. 318-468.000.

Yokoyama, Masakatu: *See*—
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Yokoyama, Masashi; and Hara, Naoki, to Honda Giken Kogyo Kabushiki Kaisha. Motor scooter. 4,964,483, Cl. 180-219.000.

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Yoshida, Hiroshi; Noguchi, Takeki; Ichikawa, Masahiko; Nakane, Takemi; Kubo, Kyoji; and Kinoshita, Kenichiro, to Chubu Electric Power Company Inc.; and Mitsubishi Jukogyo Kabushiki Kaisha. Moisture content measuring system. 4,964,734, Cl. 374-14.000.

Yoshida, Kazuaki: *See*—
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Yoshida, Naoyuki: *See*—
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Yoshida, Norio; and Shimizu, Hiroshi, to NEC Corporation. Synchronizer for establishing synchronization between data and clock signals. 4,965,814, Cl. 375-111.000.

Yoshida, Shinichi, to Sharp Kabushiki Kaisha. Data flow type information processor. 4,965,715, Cl. 364-200.000.

Yoshida, Syotaro: *See*—
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Yoshida, Tomoe: *See*—
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Yoshida, Yasuharu, to NEC Corporation. Quadrature amplitude modulation system using digital filters. 4,965,536, Cl. 332-103.000.

Yoshimura, Hisashi, to Sharp Kabushiki Kaisha. Printing head of color ink jet printer. 4,965,595, Cl. 346-140.00R.

Yoshimura, Motonobu: *See*—
Kawahara, Haruyuki; Tanaka, Katsumi; Ashiura, Yasuyuki; and Yoshimura, Motonobu, 4,964,801, Cl. 433-173.000.

Yoshimura, Noriaki: *See*—
Maeda, Toshihiko; and Yoshimura, Noriaki, 4,965,404, Cl. 562-35.000.

Yoshinaga, Kazuo: *See*—
Kurabayashi, Yutaka; Ohnishi, Toshikazu; Yoshinaga, Kazuo; Mouri, Akihiro; Isaka, Kazuo; Kaneko, Shuzo; Eguchi, Takeo; and Toshida, Yomishi, 4,965,591, Cl. 346-108.000.

Yoshino, Hitoshi: *See*—
Imataki, Hiroyuki; Hiraoka, Mizuho; Ichikawa, Sachiko; Yoshino, Hitoshi; and Ogawa, Yoshihiro, 4,965,153, Cl. 430-11.000.

Yoshino, Tuyoshi, to Matsushita Electric Industrial Co., Ltd. Permanent magnet type erasing head. 4,965,688, Cl. 360-118.000.

Yoshitake, Akira; and Sakashita, Motoki, to Kubota Corporation. Suction roll made of a martensitic stainless steel. 4,964,924, Cl. 148-325.000.

Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Nakao, Toru; Morita, Kenji; Hisadome, Masao; and Takehara, Shuzo, 4,965,264, Cl. 514-248.000.
Saeki, Kazumi; Inoue, Takeshi; and Horie, Shoichi, 4,965,395, Cl. 560-11.000.

Youmans, Donald W. Mobile home positioner. 4,964,775, Cl. 414-12.000.

Younes, Usama E., to Arco Chemical Technology, Inc. Laminated composite of a rigid polyurethane modified polyisocyanurate substrate an metal, plastic, cellulose, glass, ceramic or combinations thereof. 4,965,038, Cl. 264-552.000.

Young, Carl W. Remotely controlled lawn mower. 4,964,265, Cl. 56-10.800.

Young, Donald C.; and Daniels, Philim B., to Thorn Emi plc. Microengineered diaphragm pressure switch. 4,965,415, Cl. 200-83.00N.

Young, Donald E.: *See*—
Insley, Thomas I.; Dyrud, James F.; and Young, Donald E., 4,964,509, Cl. 206-204.000.

Young, Grant A.: *See*—
Wakley, William D.; Worrell, J. Robert; and Young, Grant A., 4,964,994, Cl. 210-512.100.

Young, Paul I.; and Wolfe, Jesse D., to BOC Group, Inc., The. Solar control layered coating for glass windows. 4,965,121, Cl. 428-213.000.

Young, Paul R.; Richard, David W.; Treff, Arthur J.; and Staehly, Christopher E., to Raymond Engineering Inc. Disc drive assembly for magnetic disc memory unit. 4,965,686, Cl. 360-98.070.

Yourd, Raymond A., III: *See*—
Gruber, Robert J.; Yourd, Raymond A., III; Julien, Paul C.; Bolte, Steven B.; and Knapp, John F., 4,965,158, Cl. 430-106.600.

Yudelson, Joseph S., to Eastman Kodak Company. Encapsulated superparamagnetic particles. 4,965,007, Cl. 252-62.530.

Yuge, Masao: *See*—
Okabayashi, Shigeo; Egawa, Mototaka; and Yuge, Masao, 4,964,912, Cl. 106-705.000.

Yukimoto, Sadao: *See*—
Hirose, Toshifumi; Yukimoto, Sadao; and Isayama, Katsuhiko, 4,965,311, Cl. 524-483.000.

Yukumoto, Masao; Shibuya, Kiyoshi; Morito, Nobuyuki; and Hiramatsu, Teruo, to Kawasaki Steel Corporation. Method of transporting rapidly quenched ribbon and apparatus therefor. 4,964,583, Cl. 242-56.00R.

Yumori, Isao R.: *See*—
Dombrowski, James H.; Mummery, Herbert L.; Buecher, Roger W.; and Yumori, Isao R., 4,964,491, Cl. 188-299.000.

Yuyama, Masahiro; Koyama, Teruhisa; Matsurra, Hideaki; and Date, Shinji, to Sumitomo Chemical Co., Ltd. Thermoplastic copolymer. 4,965,321, Cl. 525-329.700.

Zafiroglu, Dimitri P.: *See*—
Bair, Thomas I.; and Zafiroglu, Dimitri P., 4,965,129, Cl. 428-398.000.

Zah, Chung-En, to Bell Communications Research, Inc. Angled-facet flared-waveguide traveling-wave laser amplifiers. 4,965,525, Cl. 330-4.300.

Zahnradfabrik Friedrichshafen AG: *See*—
Lutz, Rolf; Reinalter, Franz; and Fiechtner, Heinz, 4,964,505, Cl. 192-53.00F.

Zaltzberg, Mark J.: *See*—
Piumo, Carmen; Livesey, Stephen; Linner, John G.; del Campo, Anthony A.; and Zaltzberg, Mark J., 4,964,280, Cl. 62-78.000.

Zambrano, Raffaele; and Musumeci, Salvatore, to SGS-Thomson Microelectronics S.r.L. Manufacturing process for a monolithic semiconductor device comprising at least one transistor of an integrated control circuit and one power transistor integrated on the same chip. 4,965,215, Cl. 437-31.000.

Zamora, Elena M., to International Business Machines Corporation. Computer method for automatic extraction of commonly specified information from business correspondence. 4,965,763, Cl. 364-900.000.

Zanio, Ken; and Bean, Ross C., to Ford Aerospace Corporation. Manufacture of monolithic infrared focal plane arrays. 4,965,649, Cl. 357-30.000.

Zapp, Regie H.: *See*—
Halm, Roland L.; Zapp, Regie H.; and Streu, Rick D., 4,965,388, Cl. 556-472.000.

Zayats, Andrei J.: *See*—
Goldovsky, Viktor L.; Stetsovich, Viktor I.; and Zayats, Andrei J., 4,964,725, Cl. 356-308.000.

Zeck, Walter M.: *See*—
Anderson, John; Homeyer, Bernhard; Kuhle, Engelbert; Scheinpflug, Hans; Zeck, Walter M.; and Simonet, Donald E., 4,965,254, Cl. 514-89.000.
Anderson, John; Homeyer, Bernhard; and Zeck, Walter M., 4,965,255, Cl. 514-128.000.
Anderson, John; Homeyer, Bernhard; and Zeck, Walter M., 4,965,256, Cl. 514-128.000.

Zeenni, Joseph; and Duceppe, Antoine. Fingernail treating device. 4,964,372, Cl. 132-74.500.

Zeh, Heiko: *See*—
Ohngemach, Jorg; and Zeh, Heiko, 4,965,294, Cl. 522-79.000.

Zekoski, Joseph: *See*—
Harrison, Danny E.; and Zekoski, Joseph, 4,964,452, Cl. 152-554.000.

Zelenak, Daniel G., Jr.: *See*—
Bishop, Robert J.; Fontecchio, Robert P.; and Zelenak, Daniel G., Jr., 4,964,654, Cl. 280-743.000.

Zelinsky, Michael A.: *See*—
Keister, Pamela P.; Mead, Ralph T.; Muffoletto, Barry C.; Takeuchi, Esther S.; Ebel, Steven J.; Zelinsky, Michael A.; and Greenwood, John M., 4,964,877, Cl. 29-623.100.

Zellweger, Ruedi: *See*—
Cadeo, Angelo; and Zellweger, Ruedi, 4,964,732, Cl. 366-159.000.

Zingher, Arthur R.: *See*—
Flint, Ephraim B.; Grebe, Kurt R.; Gruber, Peter A.; and Zingher, Arthur R., 4,964,458, Cl. 165-80.400.

Zinner, Alexander J., III: *See*—
Leahey, Edward; Zinner, Alexander J., III; and Howard, Christopher A., 4,964,410, Cl. 128-696.000.

Zinser Textilmaschines GmbH: *See*—
Dinkelmann, Friedrich h, 4,964,269, Cl. 57-281.000.

Zoeller, Joseph R.; and Blount, William W., to Eastman Kodak Company. 1,5-diaryl-3-pentanol compounds and processes for the preparation thereof. 4,965,399, Cl. 560-64.000.

2500 Corporation, The: *See*—
Spica, Joseph P., 4,964,247, Cl. 52-12.000.

501 Aichi Kikai Kogyo Kabushiki Kaisha: *See*—
Takayama, Mitsunao; Nakazawa, Takeshi; Yamauchi, Kozo; and Asano, Atsushi, 4,964,841, Cl. 474-11.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF OCTOBER, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Alexander, William J., III. Tension control for web handling apparatus. Re. 33,399, Cl. 318-7.000.

Anders, Gary P. Disposable pan. Re. 33,397. Cl. 220-94.00R.

Autoliv Development AB: *See*—
Grunewald, Hans-Joachim, Re. 33,398, Cl. 280-808.000.

Beck, Lee R.: *See*—
Stolle, Ralph J.; and Beck, Lee R., Re. 33,403, Cl. 424-87.000.

Chisholm, John P., to Sundstrand Data Control, Inc. Microwave landing system. Re. 33,401, Cl. 342-408.000.

Chu, Tsann M.; Wang, Ming C.; and Papsidero, Lawrence, to Research Corporation Technologies, Inc. Purified human prostate antigen. Re. 33,405, Cl. 530-350.000.

Continental Can Company, Inc.: *See*—
Payne, Robert D.; Pazak, James E.; and Szpitalak, Wesley J., Re. 33,394, Cl. 118-622.000.

Fujihisa, Hiroaki: *See*—
Fujii, Hiroshi; Fujihisa, Hiroaki; Ohishi, Hirotoshi; and Kobayashi, Yoshiaki, Re. 33,400, Cl. 335-26.000.

Fujii, Hiroshi; Fujihisa, Hiroaki; Ohishi, Hirotoshi; and Kobayashi, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Circuit breaker. Re. 33,400, Cl. 335-26.000.

Grunewald, Hans-Joachim, to Autoliv Development AB. Seat belt fitting. Re. 33,398, Cl. 280-808.000.

Kobayashi, Yoshiaki: *See*—
Fujii, Hiroshi; Fujihisa, Hiroaki; Ohishi, Hirotoshi; and Kobayashi, Yoshiaki, Re. 33,400, Cl. 335-26.000.

Mazur, Edward J.: *See*—
Voltmer, Helmut; Schwenzer, Alfred F.; and Mazur, Edward J., Re. 33,396, Cl. 156-552.000.

Megabit Communications, Inc.: *See*—
Milligan, Hayden, Re. 33,404, Cl. 340-825.000.

Milligan, Hayden, to Megabit Communications, Inc. Enhanced distance data transmission system. Re. 33,404, Cl. 340-825.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Fujii, Hiroshi; Fujihisa, Hiroaki; Ohishi, Hirotoshi; and Kobayashi, Yoshiaki, Re. 33,400, Cl. 335-26.000.

New Jersey Machine Inc.: *See*—
Voltmer, Helmut; Schwenzer, Alfred F.; and Mazur, Edward J., Re. 33,396, Cl. 156-552.000.

Ohishi, Hirotoshi: *See*—
Fujii, Hiroshi; Fujihisa, Hiroaki; Ohishi, Hirotoshi; and Kobayashi, Yoshiaki, Re. 33,400, Cl. 335-26.000.

Papsidero, Lawrence: *See*—
Chu, Tsann M.; Wang, Ming C.; and Papsidero, Lawrence, Re. 33,405, Cl. 530-350.000.

Payne, Robert D.; Pazak, James E.; and Szpitalak, Wesley J., to Continental Can Company, Inc. System for inside powder striping of welded food cans. Re. 33,394, Cl. 118-622.000.

Pazak, James E.: *See*—
Payne, Robert D.; Pazak, James E.; and Szpitalak, Wesley J., Re. 33,394, Cl. 118-622.000.

Peters, Rick E. Ankle brace. Re. 33,395, Cl. 128-80.00H.

Portavideo International, Inc.: *See*—
Thrush, Ted K., Re. 33,402, Cl. 360-33.100.

Research Corporation Technologies, Inc.: *See*—
Chu, Tsann M.; Wang, Ming C.; and Papsidero, Lawrence, Re. 33,405, Cl. 530-350.000.

Schwenzer, Alfred F.: *See*—
Voltmer, Helmut; Schwenzer, Alfred F.; and Mazur, Edward J., Re. 33,396, Cl. 156-552.000.

Stolle, Ralph J.; and Beck, Lee R., to Stolle Research & Development Corporation. Method for treating disorders of the vascular and pulmonary systems. Re. 33,403, Cl. 424-87.000.

Stolle Research & Development Corporation: *See*—
Stolle, Ralph J.; and Beck, Lee R., Re. 33,403, Cl. 424-87.000.

Sundstrand Data Control, Inc.: *See*—
Chisholm, John P., Re. 33,401, Cl. 342-408.000.

Szpitalak, Wesley J.: *See*—
Payne, Robert D.; Pazak, James E.; and Szpitalak, Wesley J., Re. 33,394, Cl. 118-622.000.

Thrush, Ted K., to Portavideo International, Inc. Protective carrying case for video cassette apparatus and method of enclosing thereof. Re. 33,402, Cl. 360-33.100.

Voltmer, Helmut; Schwenzer, Alfred F.; and Mazur, Edward J., to New Jersey Machine Inc. Literature applying mechanism. Re. 33,396, Cl. 156-552.000.

Wang, Ming C.: *See*—
Chu, Tsann M.; Wang, Ming C.; and Papsidero, Lawrence, Re. 33,405, Cl. 530-350.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Hitachi Ltd.: *See*—
Inui, Taiji; and Sasaki, Makoto, B1 4,466,241, Cl. 60-39.182.

Inui, Taiji; and Sasaki, Makoto, to Hitachi Ltd. Waste heat recovery boiler. B1 4,466,241, 10-23-90, Cl. 60-39.182.

Sasaki, Makoto: *See*—
Inui, Taiji; and Sasaki, Makoto, B1 4,466,241, Cl. 60-39.182.

LIST OF DESIGN PATENTEES

Aircraft Dynamics Corporation: *See*—
Jones, Jack D.; and Lewis, Carl A., 311,591, Cl. D26-44.000.

Alm, Paul R., to Santa Fe Service & Sales, Inc. Power bander. 311,545, 10-23-90, Cl. D15-145.000.

American Cyanamid Company: *See*—
Woodruff, Keith F., 311,570, Cl. D23-209.000.

Amway Corporation: *See*—
Schirado, Lowell C., 311,500, Cl. D10-106.000.

Andoe Inc.: *See*—
Dobelle, Howard, 311,610, Cl. D30-109.000.

Atol Design, Inc.: *See*—
Ehret, Bernard, 311,452, Cl. D3-71.000.

Avangard Trading Company: *See*—
Camara, Jaime, 311,479, Cl. D7-666.000.

Bakic, Karena, to Cosmede Anstalt. Lipstick cases. 311,604, 10-23-90, Cl. D28-85.000.

Ballu, Patrick J., to TECNOMA. Hand sprayer. 311,571, 10-23-90, Cl. D23-225.000.

Ban, Kimiyoshi; and Komaba, Shinji, to Kabushiki Kaisha Toshiba. Video tape recorder. 311,534, 10-23-90, Cl. D14-135.000.

Battaglia, Asthony. Comb. 311,602, 10-23-90, Cl. D28-30.000.

Battaglia, Samuel: *See*—
Wickrema, Gamini; DeSouza, Joseph; and Battaglia, Samuel, 311,540, Cl. D14-233.000.

Battisti, Thomas T., to General Binding Corporation. Binding apparatus. 311,549, 10-23-90, Cl. D19-26.000.
Benchimol, Joseph; and Dahnz, Werner E. Showcase light fixture. 311,589, 10-23-90, Cl. D26-24.000.
Berfield, Robert C.; and Meland, Ronald F., to Shop-Vac Corporation. Vacuum cleaner nozzle. 311,615, 10-23-90, Cl. D32-32.000.
Bisgaard, Nikolai: *See—*
Jonsson, Bjarne; Jensen, Finn; Langhorn, Karsten; and Bisgaard, Nikolai, 311,521, Cl. D14-226.000.
Bompard, Francois, to 501 Laboratoires de Biologie Vegetale Yves Rocher, The. Combined bottle and stopper. 311,491, 10-23-90, Cl. D9-385.000.
Boose, Larry L., to Westvaco Corporation. Carton. 311,493, 10-23-90, Cl. D9-416.000.
Bordewyk, Donna, to City of Alpena. Flag. 311,503, 10-23-90, Cl. D11-172.000.
Braden, Michael P. Cigarette lighter carrying case. 311,599, 10-23-90, Cl. D27-172.000.
Brian Drumm Flattopper Limited: *See—*
Drumm, Brian J., 311,603, Cl. D28-31.000.
Bulgari, Paolo, to Partecipazioni Bulgari S.p.A. Earring. 311,502, 10-23-90, Cl. D11-75.000.
Buri, Fred C., Jr.; and Buri, Fred H., Sr. Baseball and bat rack. 311,565, 10-23-90, Cl. D21-223.000.
Buri, Fred H., Sr.: *See—*
Buri, Fred C., Jr.; and Buri, Fred H., Sr., 311,565, Cl. D21-223.000.
Burns, Jack. Vehicle console map organizer and storage unit. 311,450, 10-23-90, Cl. D3-40.000.
Burns, Marvin D., to Champion Spark Plug Company. Combined valve and gauge. 311,572, 10-23-90, Cl. D23-235.000.
Butler, Daniel E.; and McIlvaine, Neil G., to Physio-Control Corporation. Cardiac pacemaker. 311,580, 10-23-90, Cl. D24-17.000.
Camara, Jaime, to Avangard Trading Company. Hand operated fruit juicer. 311,479, 10-23-90, Cl. D7-666.000.
Canon Kabushiki Kaisha: *See—*
Hamada, Tomohiko; and Sakai, Masaaki, 311,526, Cl. D14-114.000.
Caribbean Stud Enterprises, Inc.: *See—*
Hoffman, Benjamin F., 311,474, Cl. D6-318.000.
Carre, Alain, to 501 France Cables ET Radio. Audioconference telephonic terminal set. 311,541, 10-23-90, Cl. D14-240.000.
Casio Computer Co., Ltd.: *See—*
Yoshitake, Isamu, 311,547, Cl. D18-4.000.
Central Systems & Controls Corp.: *See—*
Reali, Patrick J., 311,519, Cl. D13-152.000.
CertainTeed Corporation: *See—*
Westphal, Dennis; and Piles, Jonathan, 311,584, Cl. D25-122.000.
Westphal, Dennis; and Piles, Jonathan, 311,585, Cl. D25-122.000.
Westphal, Dennis; and Piles, Jonathan, 311,586, Cl. D25-122.000.
Champion Spark Plug Company: *See—*
Burns, Marvin D., 311,572, Cl. D23-235.000.
Chan, David M. Keychain. 311,451, 10-23-90, Cl. D3-62.000.
Cheung, David; Yiu, Wu T.; and Leung, Donny, to Video Technology Industries, Inc. Housing for an electronic educational video system. 311,523, 10-23-90, Cl. D14-100.000.
Chin, Henry Y.: *See—*
Reeves, Behren K.; Chin, Henry Y.; and Vossoughi, Sohrab, 311,536, Cl. D14-137.000.
Ciganko, David J., to Quaker Oats Company, The. Toy house. 311,566, 10-23-90, Cl. D21-114.000.
Cimtron Corp.: *See—*
Krolopp, Rudy, 311,495, Cl. D10-15.000.
City of Alpena: *See—*
Bordewyk, Donna, 311,503, Cl. D11-172.000.
Clark Equipment Company: *See—*
Reinhart, Jay J., 311,505, Cl. D12-14.000.
Clayton, Gene. Back scratcher. 311,605, 10-23-90, Cl. D28-99.000.
Cleveland Clinic Foundation, The: *See—*
Cosgrove, Delos M., III; Forbes, Lawrence E.; and Rodono, Anthony, 311,470, Cl. D6-601.000.
Collins, John A., Jr. Orthodontic appliance. 311,579, 10-23-90, Cl. D24-10.000.
Corneliess, Kevin J. Telephone handset. 311,542, 10-23-90, Cl. D14-248.000.
Cosgrove, Delos M., III; Forbes, Lawrence E.; and Rodono, Anthony, to Cleveland Clinic Foundation, The. Leg support cushion. 311,470, 10-23-90, Cl. D6-601.000.
Cosmede Anstalt: *See—*
Bakic, Karena, 311,604, Cl. D28-85.000.
Craig, Carl E. Trailer hitch guide. 311,511, 10-23-90, Cl. D12-162.000.
Crookes, William E.: *See—*
Hardzinski, James E.; Sebben, Daniel A.; Herren, Kenneth E.; Crookes, William E.; and Nickles, Daniel R., 311,543, Cl. D15-17.000.
Dahnz, Werner E.: *See—*
Benchimol, Joseph; and Dahnz, Werner E., 311,589, Cl. D26-24.000.
Dali, Theodore. Tongs and similar article. 311,478, 10-23-90, Cl. D7-686.000.
Dawahare, Frank G. Disposable bib for motor vehicle occupants. 311,445, 10-23-90, Cl. D2-229.000.
Deere & Company: *See—*
Hardzinski, James E.; Sebben, Daniel A.; Herren, Kenneth E.; Crookes, William E.; and Nickles, Daniel R., 311,543, Cl. D15-17.000.
Defayette, Andre ; and Millette, Yves. Card game scoreboard. 311,501, 10-23-90, Cl. D10-46.100.
De Frahan, Patrick H., to Innovative Trading & Services S.A. Medallion. 311,504, 10-23-90, Cl. D11-79.000.
DeSouza, Joseph: *See—*
Wickrema, Gamini; DeSouza, Joseph; and Battaglia, Samuel, 311,540, Cl. D14-233.000.
Dewees, John G.: *See—*
Prendergast, William; and Dewees, John G., 311,462, Cl. D6-455.000.
Prendergast, William; and Dewees, John G., 311,467, Cl. D6-461.000.
Diamond, Paul. Ironing accessory for attachment to a hair blow dryer. 311,617, 10-23-90, Cl. D32-68.000.
Dideriksen, Erling T., to Interlego AG. Brush for a toy car wash. 311,553, 10-23-90, Cl. D21-59.000.
Dobelle, Howard, to Andoe Inc. Pet carrying case. 311,610, 10-23-90, Cl. D30-109.000.
Dordick, Fran M.; and Porter, David H., to L. D. Kichler Co. Glass lamp shade. 311,598, 10-23-90, Cl. D26-133.000.
Drumm, Brian J., to Brian Drumm Flattopper Limited. Hair comb. 311,603, 10-23-90, Cl. D28-31.000.
Durand, Jean-Jacques. Vacuum pitcher. 311,475, 10-23-90, Cl. D7-317.000.
E.F. Seeley Nominees Pty. Ltd.: *See—*
Kearney, Anthony D.; and Sare, Gilbert J., 311,575, Cl. D23-351.000.
Eastman Kodak Company: *See—*
Leonard, Bruce A.; and Hansen, David E., 311,546, Cl. D16-209.000.
Edwards, Mary S. Clip trick amusement device. 311,569, 10-23-90, Cl. D21-241.000.
Ehret, Bernard, to Atol Design, Inc. Duffel bag with side pockets. 311,452, 10-23-90, Cl. D3-71.000.
Espin, Helen P.: *See—*
Espin, Mario W., 311,483, Cl. D8-86.000.
Espin, Mario W., to Espin, Helen P. Screw driver bit. 311,483, 10-23-90, Cl. D8-86.000.
Everingham, Simon J., to Simair Graphics Equipments Limited. Airbrush spray booth. 311,576, 10-23-90, Cl. D23-371.000.
Ewald, Howard H. Dental flosser. 311,595, 10-23-90, Cl. D28-64.000.
Failor, Raymond A.; and Hayton, Eugene P., to Hausted, Inc. Patient's chair. 311,509, 10-23-90, Cl. D12-131.000.
Fallgatter, James C.: *See—*
Fallgatter, Tarla A.; and Fallgatter, James C., 311,477, Cl. D7-619.000.
Fallgatter, Tarla A.; and Fallgatter, James C. Stabilizing cup holder. 311,477, 10-23-90, Cl. D7-619.000.
Fang, Elton H. S. Computer. 311,525, 10-23-90, Cl. D14-100.000.
Fenne, Kenneth R., to Pittway Corporation. Flashlight. 311,593, 10-23-90, Cl. D26-46.000.
Ferrari Societa Per Azioni Esercizio Fabriche Automobile: *See—*
Fioravanti, Leonardo, 311,512, Cl. D12-196.000.
Fioravanti, Leonardo, to Ferrari Societa Per Azioni Esercizio Fabriche Automobile. Automobile rear quarter panel exterior surface. 311,512, 10-23-90, Cl. D12-196.000.
Florida Pool Products, Inc.: *See—*
Wolfe, Henry S., 311,562, Cl. D21-168.000.
Wolfe, Henry S., 311,563, Cl. D21-168.000.
Wolfe, Henry S., 311,564, Cl. D21-168.000.
Fontana, Joseph T.: *See—*
Gorse, John M.; Fontana, Joseph T.; and Henderson, Peggy A., 311,561, Cl. D21-166.000.
Forbes, Lawrence E.: *See—*
Cosgrove, Delos M., III; Forbes, Lawrence E.; and Rodono, Anthony, 311,470, Cl. D6-601.000.
Foster, Bruce E.: *See—*
Popek, Bruce P.; and Foster, Bruce E., 311,556, Cl. D21-105.000.
Franzini, Angelo; and Fricker, Eric. Loudspeaker enclosure. 311,539, 10-23-90, Cl. D14-221.000.
Freeman, Thomas R.: *See—*
Kemna, Jill L.; and Freeman, Thomas R., 311,448, Cl. D2-331.000.
Fricker, Eric: *See—*
Franzini, Angelo; and Fricker, Eric, 311,539, Cl. D14-221.000.
Friedkin Industries, Inc.: *See—*
Shell, Irving W., 311,583, Cl. D25-119.000.
Fujii, Yoshito: *See—*
Kurozumi, Shigeru; Fujii, Yoshito; Saeki, Taisuke; and Kajimoto, Hiroshi, 311,530, Cl. D14-126.000.
Fujii, Yukihiro; Segawa, Yuichi; and Kitakaze, Jyoji, to Sanyo Electric Co., Ltd. Portable computer. 311,527, 10-23-90, Cl. D14-106.000.
Fuller, John M., to Rubbermaid Commercial Products Inc. Foal feeder. 311,612, 10-23-90, Cl. D20-131.000.
Fuller, John M., to Rubbermaid Commercial Products Inc. Stable cart. 311,621, 10-23-90, Cl. D34-18.000.
Funatsu, Kunio: *See—*
Hirano, Yukio; Funatsu, Kunio; Nukazawa, Joseph J.; Narikawa, Tadakazu; and Yamada, Junichi, 311,614, Cl. D32-21.000.
Geisler, Herbert A., Jr. Solar generator. 311,516, 10-23-90, Cl. D13-102.000.
General Binding Corporation: *See—*
Battisti, Thomas T., 311,549, Cl. D19-26.000.
Geo. A. Hormel & Co.: *See—*
Regenscheid, Duane M., 311,488, Cl. D9-345.000.
Gilchrist, Evelyn S. Diaper for babies with an umbilical cord remnant. 311,582, 10-23-90, Cl. D24-50.000.
Giles, Michael H. Combined pillow, cassette player and speakers. 311,472, 10-23-90, Cl. D6-601.000.

Giorgio, Inc.: *See—*
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Jonsson, Bjarne; Jensen, Finn; Langhorn, Karsten; and Bisgaard, Nikolai, 311,521, Cl. D14-226.000.

Goluke, Stanislaus J. B. Balancing machine for vehicle wheels. 311,498, 10-23-90, Cl. D10-82.000.

Gorse, John M.; Fontana, Joseph T.; and Henderson, Peggy A. Doll configuration. 311,561, 10-23-90, Cl. D21-166.000.

Gravagna, Mark V. Vehicle supported dump cart. 311,619, 10-23-90, Cl. D34-3.000.

Greene, Michael W., to Little Lake Industries, Inc. Chair. 311,460, 10-23-90, Cl. D6-379.000.

Grossbart, A. Joel. Hanging picture frame. 311,456, 10-23-90, Cl. D6-301.000.

Hamada, Tomohiko; and Sakai, Masaaki, to Canon Kabushiki Kaisha. Opti-magnetic disc cartridge. 311,526, 10-23-90, Cl. D14-114.000.

Hamilton, Melvin: *See—*
Lee, Gary; and Hamilton, Melvin, 311,461, Cl. D6-380.000.

Hansen, David E.: *See—*
Leonard, Bruce A.; and Hansen, David E., 311,546, Cl. D16-209.000.

Hara, Kunio; and Hiroki, Shinichi, to Kabushiki Kaisha Toshiba. Facsimile. 311,529, 10-23-90, Cl. D14-118.000.

Harding, Bridget M. Sternal incision protector. 311,608, 10-23-90, Cl. D29-10.000.

Hardzinski, James E.; Sebben, Daniel A.; Herren, Kenneth E.; Crookes, William E.; and Nickles, Daniel R., to Deere & Company. Engine hood. 311,543, 10-23-90, Cl. D15-17.000.

Hart, Richard S.: *See—*
Valiga, Richard A.; and Hart, Richard S., 311,554, Cl. D21-71.000.

Hasbro, Inc.: *See—*
Popek, Bruce P.; and Foster, Bruce E., 311,556, Cl. D21-105.000.

Hatfield, Tinker L., to Nike, Inc.; and Nike International, Ltd. Cup shaped sole. 311,447, 10-23-90, Cl. D2-320.000.

Hausted, Inc.: *See—*
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Havis-Shields Equipment Corporation: *See—*
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Hayes, Edward H.; and Walker, James F., to North Alabama Pipe Corporation. Cutting torch guide and alignment device. 311,544, 10-23-90, Cl. D15-127.000.

Hayton, Eugene P.: *See—*
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Henderson, Peggy A.: *See—*
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Henry, Ricky L. Angled fire protection port. 311,606, 10-23-90, Cl. D29-5.000.

Herren, Kenneth E.: *See—*
Hardzinski, James E.; Sebben, Daniel A.; Herren, Kenneth E.; Crookes, William E.; and Nickles, Daniel R., 311,543, Cl. D15-17.000.

Herst, Douglas J.; and Salman, Utkan, to Peerless Lighting Corporation. Wall mounted lensed indirect luminaire. 311,506, 10-23-90, Cl. D26-85.000.

Hickman, Joe G. Spool hub connector unit. 311,486, 10-23-90, Cl. D8-358.000.

Hill, Joey D., to Hill, Joey Dean. Illuminated house number. 311,551, 10-23-90, Cl. D20-17.000.

Hill, Joey Dean: *See—*
Hill, Joey D., 311,551, Cl. D20-17.000.

Hino, Ichiro: *See—*
Tsuchiya, Masayoshi; and Hino, Ichiro, 311,537, Cl. D14-165.000.

Hirano, Yukio; Funatsu, Kunio; Nukazawa, Joseph J.; Narikawa, Tadakazu; and Yamada, Junichi, to Matsushita Electric Industrial Co., Ltd. Electric vacuum cleaner. 311,614, 10-23-90, Cl. D32-21.000.

Hiroki, Shinichi: *See—*
Hara, Kunio; and Hiroki, Shinichi, 311,529, Cl. D14-118.000.

Hirota, Makoto: *See—*
Itoh, Akio; Hirota, Makoto; and Nagano, Atsushi, 311,515, Cl. D13-101.000.

Hoffman, Benjamin F., to Caribbean Stud Enterprises, Inc. Game table covering. 311,474, 10-23-90, Cl. D6-318.000.

Holmes, Kenneth E., to Mothers Polishes Waxes Cleaners. Bottle. 311,489, 10-23-90, Cl. D9-367.000.

Holmstrom, Erik F. Adjustable chair. 311,459, 10-23-90, Cl. D6-367.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
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Howells, Thomas H., to Vitalograph, Inc. Mouth to mouth resuscitator. 311,607, 10-23-90, Cl. D29-7.000.

Huffy Corporation: *See—*
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Hunts, Rick E. Vacuum cleaner hose attachment. 311,616, 10-23-90, Cl. D32-32.000.

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Knight, Leland W., 311,522, Cl. D14-106.000.

Ingold, William E.: *See—*
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Ishizuka, Shigeo: *See—*
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Itoh, Akio; Hirota, Makoto; and Nagano, Atsushi, to Sharp Corporation. Converter housing. 311,515, 10-23-90, Cl. D13-101.000.

Jacoby, Elliot G.; and Swartvagher, Rita R., to Lutron Electronics Co., Inc. Lighting control faceplate. 311,485, 10-23-90, Cl. D8-353.000.

Jacques, Patrick. Golf stroke practice aid. 311,568, 10-23-90, Cl. D21-234.000.

Jensen, Finn: *See—*
Jonsson, Bjarne; Jensen, Finn; Langhorn, Karsten; and Bisgaard, Nikolai, 311,521, Cl. D14-226.000.

Jones, Gary B., to Havis-Shields Equipment Corporation. Electric lantern. 311,592, 10-23-90, Cl. D26-44.000.

Jones, Jack D.; and Lewis, Carl A., to Aircraft Dynamics Corporation. Combined battery and flashlight. 311,591, 10-23-90, Cl. D26-44.000.

Jonsson, Bjarne; Jensen, Finn; Langhorn, Karsten; and Bisgaard, Nikolai, to GN Netcom A/S. Combined earphone and microphone. 311,521, 10-23-90, Cl. D14-226.000.

Kabushiki Kaisha Toshiba: *See—*
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Kurozumi, Shigeru; Fujii, Yoshito; Saeki, Taisuke; and Kajimoto, Hiroshi, 311,530, Cl. D14-126.000.

Kameyama, Isao; and Maeda, Akira, to Yazaki Corporation. Housing for an electrical connector. 311,517, 10-23-90, Cl. D13-146.000.

Kardon Industries, Inc.: *See—*
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Kearney, Anthony D.; and Sare, Gilbert J., to E.F. Seeley Nominees Pty. Ltd. Air conditioner. 311,575, 10-23-90, Cl. D23-351.000.

Kemna, Jill L.; and Freeman, Thomas R., to Summerfield Industries, Inc. Sock. 311,448, 10-23-90, Cl. D2-331.000.

Khavari, Cyrous. Combined timer and clip for pilots. 311,496, 10-23-90, Cl. D10-31.000.

Kitagawa, Ryunosuke, to Sharp Corporation. Television set. 311,532, 10-23-90, Cl. D14-126.000.

Kitakaze, Jyoji: *See—*
Fujii, Yukihiro; Segawa, Yuichi; and Kitakaze, Jyoji, 311,527, Cl. D14-106.000.

Knight, Leland W., to Industrial Innovations, Inc. Data entry terminal. 311,522, 10-23-90, Cl. D14-106.000.

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Kobayashi, Masahiko, to Kabushiki Kaisha Toshiba. Tape player. 311,538, 10-23-90, Cl. D14-165.000.

Komaba, Shinji: *See—*
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Kovats, John J., to Space Adventures, Incorporated. Toy kite. 311,555, 10-23-90, Cl. D21-89.000.

Krolopp, Rudy, to Cimtron Corp. Clock. 311,495, 10-23-90, Cl. D10-15.000.

Kubiatowicz, James. Bathtub toy. 311,552, 10-23-90, Cl. D21-59.000.

Kumakura, Daisuke, to Twin Bird Industrial Co., Ltd. Picnic box or the like. 311,476, 10-23-90, Cl. D7-605.000.

Kurita, Kazuya: *See—*
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Kuriya, Chikashi, to Sharp Corporation. Vacuum cleaner. 311,613, 10-23-90, Cl. D32-21.000.

Kurozumi, Shigeru; Fujii, Yoshito; Saeki, Taisuke; and Kajimoto, Hiroshi, to Sharp Corporation. Television set. 311,530, 10-23-90, Cl. D14-126.000.

Kuzuno, Katsutoshi; Ishizuka, Shigeo; Watanabe, Hiroshi; and Sakurai, Kazuaki, to Yazaki Corporation. Housing for an electrical connector. 311,518, 10-23-90, Cl. D13-146.000.

L. D. Kichler Co.: *See—*
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La Croix, Ann M. Scarf hanger. 311,458, 10-23-90, Cl. D6-315.000.

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Lazere, Arthur B.; Ingold, William E.; and Knilans, Bradley N., to Northgate Computer Systems, Inc. Keyboard. 311,524, 10-23-90, Cl. D14-100.000.

Lee, Gary; and Hamilton, Melvin, to Helikon Furniture Company. Chair. 311,461, 10-23-90, Cl. D6-380.000.

Leonard, Bruce A.; and Hansen, David E., to Eastman Kodak Company. Camera with integral flash unit. 311,546, 10-23-90, Cl. D16-209.000.

Les Mangeoires Hygieniques L.-M. Inc.: *See—*
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Letarte, Lucien; and Malo, Denis, to Les Mangeoires Hygieniques L.-M. Inc. Manger. 311,611, 10-23-90, Cl. D30-131.000.

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Lewis, Will A. Transistion pipe adapter. 311,573, 10-23-90, Cl. D23-262.000.

Little Lake Industries, Inc.: *See—*
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Lutron Electronics Co., Inc.: *See—*
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MacIsaac, John E., to Sebring Forest Industries, Inc. Artificial fireplace log. 311,578, 10-23-90, Cl. D23-409.000.

Maeda, Akira: *See—*
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Maeyama, Kouichi, to Kabushiki Kaisha Toshiba. Video tape player. 311,535, 10-23-90, Cl. D14-135.000.

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Letarte, Lucien; and Malo, Denis, 311,611, Cl. D30-131.000.

Marine Dynamics, Inc.: *See—*
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Marlowe, Huston; Pound, Virgil E.; and Tao, Michikazu, to PACCAR Inc. Integral truck cab roof, fairing and sun visor unit. 311,506, 10-23-90, Cl. D12-96.000.

Martin, Leo. Table. 311,468, 10-23-90, Cl. D6-487.000.

Mason, Robert L. Tip-up signal for fishing. 311,499, 10-23-90, Cl. D10-104.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Hirano, Yukio; Funatsu, Kunio; Nukazawa, Joseph J.; Narikawa, Tadakazu; and Yamada, Junichi, 311,614, Cl. D32-21.000.

Mattesky, Henry, to Magla Products. Stand for electric pressing iron combined with cord retainer. 311,618, 10-23-90, Cl. D32-73.000.

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Mead Corporation, The: *See—*
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Medina, Christopher J. Flashlight. 311,594, 10-23-90, Cl. D26-47.000.

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Merritt, Bernard A., to Reebok International Ltd. Element of a shoe upper. 311,446, 10-23-90, Cl. D2-315.000.

Metal Industries, Inc.: *See—*
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Miller, Byron R., to Mead Corporation, The. Shelf bin retaining wall. 311,469, 10-23-90, Cl. D6-491.000.

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Mitsubishi Pencil Co., Ltd.: *See—*
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Monami Products Limited: *See—*
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Morton, James F. Combined fifth wheel pin puller and tire knocker for tractor trailer hitch assemblies. 311,482, 10-23-90, Cl. D8-51.000.

Mosley, Larry D. Nursing bottle. 311,581, 10-23-90, Cl. D24-47.000.

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O'Leary, David C.; and Perna, Theodore W., Jr. , to Tuscarora Plastics, Inc. Container. 311,624, 10-23-90, Cl. D34-40.000.

Olivier, Karen A.; and Olivier, Mark T. Hair spray shield. 311,601, 10-23-90, Cl. D28-9.000.

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PACCAR Inc.: *See—*
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Partecipazioni Bulgari S.p.A.: *See—*
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Paschal, Gerald B. Combined fishing rod holder and lure box. 311,449, 10-23-90, Cl. D3-38.000.

Pearse, Bert, to Giorgio, Inc. Perfume bottle. 311,492, 10-23-90, Cl. D9-386.000.

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Herst, Douglas J.; and Salman, Utkan, 311,596, Cl. D26-85.000.

Peracca, Larry J. Cigarette clip. 311,600, 10-23-90, Cl. D27-183.000.

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Philip Morris Incorporated: *See—*
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Platt, Richard B. Wire separator structure. 311,487, 10-23-90, Cl. D8-396.000.

Poot, Jack, to Poot Lichtenergie B.V. Reflector for lamps. 311,597, 10-23-90, Cl. D26-118.000.

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Poot, Jack, 311,597, Cl. D26-118.000.

Popek, Bruce P.; and Foster, Bruce E., to Hasbro, Inc. Manipulative skills game board. 311,556, 10-23-90, Cl. D21-105.000.

Porter, David H.: *See—*
Dordick, Fran M.; and Porter, David H., 311,598, Cl. D26-133.000.

Pound, Virgil E.: *See—*
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Prendergast, William; and Dewees, John G., to Philip Morris Incorporated. Header for a merchandising display stand or the like. 311,462, 10-23-90, Cl. D6-455.000.

Prendergast, William, to Philip Morris Incorporated. Header for a merchandising display stand or the like. 311,463, 10-23-90, Cl. D6-455.000.

Prendergast, William, to Philip Morris Incorporated. Merchandising display stand or the like. 311,464, 10-23-90, Cl. D6-461.000.

Prendergast, William, to Philip Morris Incorporated. Merchandising display stand or the like. 311,465, 10-23-90, Cl. D6-461.000.

Prendergast, William, to Philip Morris Incorporated. Merchandising display stand or the like. 311,466, 10-23-90, Cl. D6-461.000.

Prendergast, William; and Dewees, John G., to Philip Morris Incorporated. Merchandising display stand or the like. 311,467, 10-23-90, Cl. D6-461.000.

Quaker Oats Company, The: *See—*
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Reebok International Ltd.: *See—*
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Reeves, Behren K.; Chin, Henry Y.; and Vossoughi, Sohrab, to Reeves, Behren K. Transceiver. 311,536, 10-23-90, Cl. D14-137.000.

Regenscheid, Duane M., to Geo. A. Hormel & Co. Microwaveable food package. 311,488, 10-23-90, Cl. D9-345.000.

Reinhart, Jay J., to Clark Equipment Company. Tow tractor. 311,505, 10-23-90, Cl. D12-14.000.

Rethman, Michael P. Toothbrush. 311,454, 10-23-90, Cl. D4-106.000.

Rice, James G. Body attachable bag. 311,453, 10-23-90, Cl. D3-100.000.

Rieger, William J.; and Skrivan, Joseph F., to Huffy Corporation. Bicycle frame. 311,508, 10-23-90, Cl. D12-111.000.

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Cosgrove, Delos M., III; Forbes, Lawrence E.; and Rodono, Anthony, 311,470, Cl. D6-601.000.

Rose, Edward L. Protective cover for trash containers or the like. 311,620, 10-23-90, Cl. D34-11.000.

Rosen, Steven B. Infant head support for use with infant retaining devices. 311,471, 10-23-90, Cl. D6-601.000.

Royce, Stephen W. Bicycle luggage rack. 311,510, 10-23-90, Cl. D12-158.000.

Rubbermaid Commercial Products Inc.: *See—*
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Saeki, Taisuke; and Shimizu, Osamu, to Sharp Corporation. Television set. 311,531, 10-23-90, Cl. D14-126.000.

Saeki, Taisuke: *See—*
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Santa Fe Service & Sales, Inc.: *See—*
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Sanyo Electric Co., Ltd.: *See—*
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Kearney, Anthony D.; and Sare, Gilbert J., 311,575, Cl. D23-351.000.

Sasaki, Chiharu; Kurita, Kazuya; and Mogi, Tomonori, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 311,507, 10-23-90, Cl. D12-110.000.

Satoh, Yasuta; and Saitoh, Shinya, to Takara Co., Ltd. Motor driven toy cactus. 311,559, 10-23-90, Cl. D21-150.000.

Satoh, Yasuta; and Saitoh, Shinya, to Takara Co., Ltd. Motor driven toy cactus. 311,560, 10-23-90, Cl. D21-150.000.

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Serco Mold Inc.: *See—*
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Sharp Corporation: *See—*
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Space Adventures, Incorporated: *See—*
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Stamps, William C. Stake puller. 311,480, 10-23-90, Cl. D8-14.000.

Stern, Adam. Toy sail boat. 311,558, 10-23-90, Cl. D21-130.000.

Stoneburner, Edwin R., Sr. Ear protector for oxygen feed line. 311,609, 10-23-90, Cl. D29-19.000.

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Thompson, James W. Cassette tray. 311,623, 10-23-90, Cl. D34-40.000.

Thompson, Theodore G., Jr. Notebook case. 311,548, 10-23-90, Cl. D19-26.000.

Thomson, Harry S.; and Raffo, David, to Monami Products Limited. Toy boat and figure. 311,557, 10-23-90, Cl. D21-130.000.

Tivoli Industries, Inc.: *See—*
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Tyrer, Steven. Golf ball mark repair tool. 311,567, 10-23-90, Cl. D21-234.000.

U.S. Philips Corporation: *See—*
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Valiga, Richard A.; and Hart, Richard S., to Radio Flyer Inc. Side extension for a toy wagon. 311,554, 10-23-90, Cl. D21-71.000.

Van Asten, Jan F., to U.S. Philips Corporation. Can-opener. 311,481, 10-23-90, Cl. D8-36.000.

VanRiper, Bradley C.; and Ong, Marlin, to Truck-Lite Co., Inc. Combination auxiliary brake light and cargo lamp for vehicles. 311,590, 10-23-90, Cl. D26-35.000.

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Video Technology Industries, Inc.: *See—*
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Westphal, Dennis; and Piles, Jonathan, to CertainTeed Corporation. Window component extrusion. 311,584, 10-23-90, Cl. D25-122.000.

Westphal, Dennis; and Piles, Jonathan, to CertainTeed Corporation. Window component extrusion. 311,585, 10-23-90, Cl. D25-122.000.

Westphal, Dennis; and Piles, Jonathan, to CertainTeed Corporation. Window component extrusion. 311,586, 10-23-90, Cl. D25-122.000.

Westvaco Corporation: *See—*
Boone, Larry L., 311,493, Cl. D9-416.000.

Wickrema, Gamini; DeSouza, Joseph; and Battaglia, Samuel, to Smoke Signal Data Systems, Inc. Infrared antenna. 311,540, 10-23-90, Cl. D14-233.000.

Wolfe, Henry S., to Florida Pool Products, Inc. Doll. 311,562, 10-23-90, Cl. D21-168.000.

Wolfe, Henry S., to Florida Pool Products, Inc. Doll. 311,563, 10-23-90, Cl. D21-168.000.

Wolfe, Henry S., to Florida Pool Products, Inc. Doll. 311,564, 10-23-90, Cl. D21-168.000.

Woodruff, Keith F., to American Cyanamid Company. Water filter cartridge housing or similar article. 311,570, 10-23-90, Cl. D23-209.000.

Yamada, Junichi: *See—*
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Zinnbauer, Gerald, to Kardon Industries, Inc. Bottle closure. 311,494, 10-23-90, Cl. D9-448.000.

501 France Cables ET Radio: *See*—
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501 Laboratoires de Biologie Vegetale Yves Rocher, The: *See*—
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LIST OF PLANT PATENTEES

Bay City Flower Co.: *See*—
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Conard-Pyle Company, The: *See*—
Meilland, Alain A., 7,361, Cl. 9.000.

Cooper, Calvin L., to Tift, Paul G., a part interest. Rome beauty apple—"Tift Spur Rome #21". 7,363, 10-23-90, Cl. 34.000.

de Ruiter's Nieuwe Rozen B.V.: *See*—
de Ruiter, Gijsbert, 7,362, Cl. 18.000.

de Ruiter, Gijsbert, to de Ruiter's Nieuwe Rozen B.V. Hybrid tea rose plant named Ruidriko. 7,362, 10-23-90, Cl. 18.000.

Gebr. Vletter & J. H. Den Haan: *See*—
Vletter, Floris, 7,365, Cl. 68.000.

Higaki, Harry, to Bay City Flower Co. Cactaceae plant named Dasher. 7,367, 10-23-90, Cl. 88.000.

Holtkamp, Reinhold, Sr. African violet plant named 'Improved Houston'. 7,366, 10-23-90, Cl. 69.000.

Meilland, Alain A., to Conard-Pyle Company, The. Rose plant — Meiselgra variety. 7,361, 10-23-90, Cl. 9.000.

Riano, Cedric J. Nectarine tree "Sun Burst". 7,364, 10-23-90, Cl. 41.000.

Tift, Paul G.: *See*—
Cooper, Calvin L., 7,363, Cl. 34.000.

Vletter, Floris, to Gebr. Vletter & J. H. Den Haan. Lily plant named 'Menton'. 7,365, 10-23-90, Cl. 68.000.

CLASSIFICATION OF PATENTS

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642 4,964,502

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38 R 4,965,859
50 A 4,965,414
61.43 M 4,965,416
83 N 4,965,415
93 S 4,965,422
86.5 4,965,417
144 R 4,965,418
147 R 4,965,419
341 4,965,420
514 4,965,421

CLASS 203
6 4,964,957

CLASS 204
5 4,964,958
15 4,964,959
64 T 4,964,973
98 4,964,960
182.3 4,964,961
192.27 4,964,963
192.3 4,964,962
224 R 4,964,964
280 4,964,965
4,964,966
292 4,964,967
298.12 4,964,969
298.19 4,964,968
301 4,964,970
403 4,964,971
418 4,964,972

CLASS 206
37.1 4,964,508
204 4,964,509
306 4,964,510
449 4,964,511
459 4,964,512
4,964,513
557 4,964,507
564 4,964,514
632 4,964,515

CLASS 208
108 4,964,974
139 4,964,975
253 4,964,979
340 4,964,980

CLASS 209
166 4,964,981
534 4,964,517
539 4,964,982

CLASS 210
168 4,964,983
188 4,964,984
198.2 4,964,985
231 4,964,986
332 4,964,987
401 4,964,988
490 4,964,989
4,964,990
500.36 4,964,991
4,964,992
510.1 4,964,993
512.1 4,964,994
634 4,964,995
4,964,996
4,964,997
650 4,964,976
654 4,964,998

CLASS 211
50 4,964,518
4,964,519
131 4,964,520

CLASS 215
32 4,964,521
100 A 4,964,522

CLASS 219
10.55 E 4,965,423
4,965,424
4,965,427
10.55 F 4,965,425
68 4,965,426
69.12 4,965,428
113 4,965,860
121.68 4,965,429
121.69 4,965,430
123 4,965,431
203 4,965,432
230 4,965,433
388 4,965,435
544 4,965,436

CLASS 220
1 T 4,964,523
3 4,964,524
3.9 4,964,525
22 4,964,526
22.3 4,964,528
90 4,964,527
94 R Re.33,397
402 4,964,529
442 4,964,530
855 4,964,531

CLASS 222
1 4,964,532
14 4,964,533
43 4,964,534
67 4,964,535
83 4,964,536
4,964,537
92 4,964,538
94 4,964,539
95 4,964,540
137 4,964,541
146.6 4,964,542
180 4,964,543
181 4,964,544
271 4,964,545
352 4,964,546
385 4,964,547
521 4,964,548

CLASS 223
66 4,964,549
91 4,964,550

CLASS 224
32 A 4,964,551
42.23 4,964,552
149 4,964,553
232 4,964,554

CLASS 225
93 4,964,555

CLASS 226
18 4,964,557
74 4,964,556

CLASS 227
8 4,964,558
178 4,964,559

CLASS 228
47 4,964,560
107 4,964,564

CLASS 229
102 4,964,561
125.15 4,964,562
162 4,964,563

CLASS 232
35 4,964,565

CLASS 235
381 4,965,437
384 4,965,438
404 4,965,439
487 4,965,440

CLASS 236
49.3 4,964,566
92 B 4,964,567

CLASS 239
8 4,964,568
13 4,964,569
36 4,964,570
88 4,964,571
230 4,964,572
283 4,964,573
589 4,964,574
655 4,964,575

CLASS 241
19 4,964,576
24 4,964,577
30 4,964,578
100 4,964,579
252 4,964,580

CLASS 242
35.6 R 4,964,581
36 4,964,582
56 R 4,964,583
4,964,584
4,964,585
72 R 4,964,586
78.1 4,964,587
199 4,964,588
201 4,964,589
261 4,964,590

CLASS 244
3.16 4,964,591
3.24 4,964,593
131 4,964,594
137.4 4,964,595
158 R 4,964,596
159 4,964,597
190 4,964,598
195 4,964,599
322 4,964,592

CLASS 248
146 4,964,600
210 4,964,601
217.4 4,964,602
230 4,964,603
262 4,964,604
311.3 4,964,605
333 4,964,606
421 4,964,607
429 4,964,608
638 4,964,609

CLASS 250
201.3 4,965,441
201.7 4,965,442
4,965,443
205 4,965,444
226 4,965,449
231.13 4,965,445
231.14 4,965,446
233 4,965,447
252.1 4,965,448
303 4,965,450
330 4,965,451
339 4,965,452
349 4,965,453
372 4,965,454
385.1 4,965,861
453.1 4,965,862
484.1 4,965,455
515.1 4,965,456

CLASS 251
1.3 4,964,610
30.02 4,964,611
129.09 4,964,612
267 4,964,613
315 4,964,614

CLASS 252
8.551 4,964,615
4,964,999
8.75 4,965,000
30 4,965,001
32.5 4,965,002
38 4,965,003
4,965,004
47 4,965,005
50 4,965,006
62.53 4,965,007
134 4,965,008
142 4,965,009
170 4,965,010
171 4,965,011
174.12 4,965,012
174.19 4,965,013
174.22 4,965,014
174.25 4,965,015
186.37 4,965,016
299.4 4,965,017
299.61 4,965,018
299.63 4,964,616
321 4,965,019
587 4,965,020
609 4,965,021

CLASS 254
8 B 4,964,617

CLASS 256
24 4,964,618
32 4,964,619

CLASS 261
34.2 4,965,023
36.1 4,965,022
130 4,964,977

CLASS 264
0.5 4,965,024
4.7 4,965,025
22 4,965,026
28 4,965,027
45.1 4,965,029
46.5 4,965,030
119 4,964,978
122 4,965,031
160 4,965,032
180 4,965,033
211 4,965,034
261 4,964,620
268 4,965,035
269 4,965,036
297.2 4,965,028
511 4,965,037
552 4,965,038
553 4,965,039

CLASS 266
90 4,964,621
168 4,964,622

CLASS 267
81 4,964,624
140.1 4,964,516
4,964,623
221 4,964,625

CLASS 270
39 4,964,626

CLASS 271
188 4,964,627

CLASS 272
70 4,964,628
76 4,964,629
93 4,964,630
117 4,964,631
118 4,964,632
125 4,964,633

CLASS 273
26 E 4,964,634
73 C 4,964,635
73 J 4,964,645
84 R 4,964,636
113 4,964,637
138 A 4,964,638
164 4,964,639
167 H 4,964,640
175 4,964,641
240 4,964,642
285 4,964,643
336 4,964,644

CLASS 277
5 4,964,646
153 4,964,647

CLASS 280
304.5 4,964,648
618 4,964,649
641 4,964,650
690 4,964,651
731 4,964,652
732 4,964,653
743 4,964,654
808 Re.33,398
851 4,964,655

CLASS 281
44 4,964,656

CLASS 285
8 4,964,657
319 4,964,658

CLASS 292
19 4,964,659
37 4,964,660
87 4,964,661
295 4,964,662

CLASS 294
1.2 4,964,663
15 4,964,664
19.2 4,964,665

CLASS 296
24.1 4,964,666
95.1 4,964,667
107 4,964,668
108 4,964,669
136 4,964,670
178 4,964,671
192 4,964,672
216 4,964,673

CLASS 297
180 4,964,674

CLASS 299
1 4,964,675

CLASS 303
52 4,964,676
89 4,964,677
91 4,964,678
100 4,964,679
115 4,964,680
116 4,964,681

CLASS 307
10.2 4,965,460
10.8 4,965,461
66 4,965,462
87 4,965,463
270 4,965,464
273 4,965,465
296.2 4,965,466
352 4,965,467
362 4,965,468
446 4,965,469
4,965,470
4,965,471
450 4,965,863
465 4,965,472
530 4,965,473
542 4,965,474

CLASS 310
13 4,965,475
51 4,965,476
114 4,965,477
249 4,965,478
313 D 4,965,479
4,965,480
316 4,965,481
323 4,965,482
324 4,965,483

CLASS 312
138.1 4,964,682
207 4,964,683

CLASS 313
15 4,965,484
43 4,965,485
270 4,965,486
422 4,965,487
449 4,965,489
499 4,965,488
569 4,965,490

CLASS 315
111.21 4,965,491
156 4,965,492
224 4,965,493
241 S 4,965,494
371 4,965,495
4,965,496

CLASS 318
7 Re.33,399
135 4,965,864
372 4,965,497
468 4,965,498
568.11 4,965,499
568.13 4,965,500
595 4,965,501
628 4,965,502
671 4,965,503
802 4,965,504

CLASS 320
13 4,965,505
23 4,965,506
48 4,965,507

CLASS 323
239 4,965,508
300 4,965,509
315 4,965,510

CLASS 324
73.1 4,965,511
103 P 4,965,512
158 MG 4,965,513
158 P 4,965,514
4,965,865
158 R 4,965,515
4,965,516
174 4,965,517
225 4,965,519
228 4,965,518
309 4,965,520
312 4,965,521
339 4,965,522
672 4,965,523

CLASS 328
72 4,965,524

CLASS 330
4.3 4,965,525
66 4,965,526
124 R 4,965,527
252 4,965,528
255 4,965,529
295 4,965,530

CLASS 331
1 A 4,965,531
4 4,965,532
18 4,965,533
37 4,965,534
116 FE 4,965,535

CLASS 332
103 4,965,536

CLASS 333
81 A 4,965,538
164 4,965,866
202 4,965,537
4,965,539
227 4,965,540
252 4,965,541

CLASS 335
5 4,965,542
26 Re.33,400
174 4,965,543
202 4,965,544

CLASS 337
140 4,965,545

CLASS 340
468 4,965,546
511 4,965,548
516 4,965,549
524 4,965,550
545 4,965,551
566 4,965,552
573 4,965,553
604 4,965,554
624 4,965,555
628 4,965,556
711 4,965,557
712 4,965,558
717 4,965,559
4,965,560
762 4,965,561
783 4,965,562
784 4,965,563
4,965,564
4,965,565
793 4,965,566
825 Re.33,404
825.16 4,965,567
825.340 4,965,568
825.440 4,965,569
825.790 4,965,570
870.350 4,965,547
932.2 4,965,571
968 4,965,572
4,965,573
995 4,965,574

CLASS 341
72 4,965,575
94 4,965,576
118 4,965,867
141 4,965,577
156 4,965,578
159 4,965,579
200 4,965,580

CLASS 342
19 4,965,581
25 4,965,582
42 4,965,583
159 4,965,584
160 4,965,585
357 4,965,586
372 4,965,587
4,965,588
4,965,602
4,965,603
374 4,965,604
408 Re.33,401

CLASS 343
700 MS 4,965,605
703 4,965,606
736 4,965,868
781 R 4,965,869
861 4,965,607

CLASS 346
1.1 4,965,608
4,965,609
4,965,610
4,965,611
4,965,612

25 4,965,613
34 4,965,614
76 PH 4,965,589
108 4,965,590
4,965,591
110 R 4,965,592
140 R 4,965,593
4,965,594
4,965,595
4,965,596
157 4,965,597
160 4,965,599
160.1 4,965,598

CLASS 350

3.76 4,964,684
96.13 4,964,687
96.2 4,964,685
96.20 4,964,688
96.21 4,964,689
4,964,690
96.23 4,964,691
96.24 4,964,692
96.29 4,964,693
96.33 4,964,694
129 4,964,695
315 4,964,696
319 4,964,697
320 4,964,698
332 4,964,699
336 4,964,700
4,964,701
339 R 4,964,702
413 4,964,703
433 4,964,704
442 4,964,705
505 4,964,706
510 4,964,707
519 4,964,708
546 4,964,709
561 4,964,686
572 4,964,710
574 4,964,711
618 4,964,712
629 4,964,713

CLASS 351

62 4,964,714
139 4,964,716
212 4,964,715
219 4,964,717

CLASS 352

50 4,965,652

CLASS 353

31 4,964,718
85 4,964,719
122 4,964,720

CLASS 354

63 4,965,601
145.1 4,965,615
212 4,965,600
4,965,616
246 4,965,617
317 4,965,618
410 4,965,619
416 4,965,620

CLASS 355

1 4,965,621
27 4,965,622
4,965,623
35 4,965,624
4,965,625
40 4,965,626
4,965,627
41 4,965,628
50 4,965,629
52 4,965,630
55 4,965,871
68 4,965,870
75 4,965,631
76 4,965,632
200 4,965,633
208 4,965,634
218 4,965,635
235 4,965,638
239 4,965,636
246 4,965,637
260 4,965,639
283 4,965,640

CLASS 356

5 4,964,721
141 4,964,723
152 4,964,722
4,964,724
308 4,964,725
357 4,964,726
373 4,964,727
427 4,964,728

CLASS 357

15 4,965,643
17 4,965,644
22 4,965,645
23.4 4,965,647
23.7 4,965,646
24 4,965,648
30 4,965,649
34 4,965,650
35 4,965,872
42 4,965,651
55 4,965,653
70 4,965,654
71 4,965,655
4,965,656
72 4,965,642
4,965,657
79 4,965,658
81 4,965,659
4,965,660

CLASS 358

12 4,965,661
78 4,965,662
80 4,965,663
4,965,664
101 4,965,665
105 4,965,666
138 4,965,667
160 4,965,668
171 4,965,669
183 4,965,670
213.13 4,965,671
298 4,965,672
335 4,965,673
341 4,965,674
4,965,675
406 4,965,676
429 4,965,677
452 4,965,678
462 4,965,679

CLASS 360

33.1 Re.33,402
41 4,965,873
60 4,965,680
64 4,965,681
70 4,965,874
73.03 4,965,682
78.12 4,965,684
94 4,965,683
97.01 4,965,685
98.07 4,965,686
103 4,965,687
118 4,965,688
131 4,965,689
132 4,965,690
133 4,965,691

CLASS 361

18 4,965,692
42 4,965,693
64 4,965,694
142 4,965,695
160 4,965,696
283 4,965,697
286 4,965,698
387 4,965,699
398 4,965,700
401 4,965,702

CLASS 362

32 4,965,701
61 4,965,703
66 4,965,706
81 4,965,704
96 4,965,707
103 4,965,705
217 4,965,875
247 4,965,876
249 4,965,457
398 4,965,708

CLASS 363

37 4,965,709
56 4,965,710
60 4,965,711
126 4,965,712
146 4,965,877

CLASS 364

149 4,965,713
187 4,965,714
200 4,965,715
4,965,716
4,965,717
4,965,718
4,965,719
4,965,720
4,965,721
4,965,722
4,965,723
4,965,724
413.1 4,965,725
413.19 4,965,726
419 4,965,458
4,965,727
434.01 4,965,879
434.05 4,965,878
434.1 4,965,728
4,965,735
426.03 4,965,729
431.09 4,965,730
442 4,965,731
460 4,965,732
468 4,965,880
469 4,965,736
474.09 4,965,733
4,965,734
474.22 4,965,737
483 4,965,738
491 4,965,739
512 4,965,740
513 4,965,741
4,965,742
4,965,743
4,965,882
518 4,965,744
4,965,745
4,965,746
519 4,965,747
4,965,748
520 4,965,749
521 4,965,750
4,965,751
522 4,965,752
4,965,753
526 4,965,754
550 4,965,755
571.01 4,965,756
576 4,965,757
578 4,965,758
604 4,965,759
713 4,965,760
726 4,965,761
760 4,965,762
900 4,965,763
4,965,764
4,965,765
4,965,766
4,965,771
4,965,772

CLASS 365

49 4,965,767
201 4,965,768
218 4,965,769
238.5 4,965,770

CLASS 366

11 4,964,731
75 4,964,729
81 4,964,730
159 4,964,732
336 4,964,733

CLASS 367

15 4,965,773
75 4,965,774
119 4,965,775
126 4,965,776
140 4,965,777
168 4,965,778

CLASS 368

80 4,965,779

CLASS 369

13 4,965,780
44.35 4,965,781
48.000 4,965,782
100 4,965,783
4,965,784
112 4,965,785

CLASS 370

32.1 4,965,786
58.1 4,965,787
60 4,965,788
79 4,965,789
85.12 4,965,790
85.2 4,965,792
94.1 4,965,791
4,965,793
079 4,965,798
105.1 4,965,794
110.1 4,965,795
112 4,965,796
4,965,797

CLASS 371

21.2 4,965,799
22.1 4,965,800
40.1 4,965,801
51.1 4,965,802
52 4,965,883

CLASS 372

5 4,965,803
32 4,965,805
45 4,965,806
92 4,965,807

CLASS 373

2 4,965,813
36 4,965,812

CLASS 374

14 4,964,734
32 4,964,735
140 4,964,736
179 4,964,737

CLASS 375

1 4,965,808
7 4,965,641
38 4,965,809
80 4,965,810
106 4,965,884
109 4,965,811
111 4,965,814
119 4,965,815

CLASS 376

236 4,965,040
258 4,965,041

CLASS 377

17 4,965,816
19 4,965,817

CLASS 378

168 4,965,885
208 4,965,818

CLASS 379

53 4,965,819
59 4,965,820
91 4,965,821
189 4,965,459
390 4,965,822
411 4,965,823
428 4,965,824

CLASS 380

9 4,965,825
19 4,965,826
21 4,965,804
25 4,965,827
50 4,965,828
4,965,881

CLASS 381

31 4,965,830
69 4,965,831
71 4,965,832
83 4,965,833
94 4,965,834
97 4,964,738
110 4,965,835
183 4,965,836
186 4,965,837
187 4,965,838
195 4,965,839

CLASS 382

1 4,965,829
4,965,840
4,965,841
8 4,965,842
44 4,965,844
50 4,965,843
56 4,965,845

CLASS 383

5 4,964,739

CLASS 384

138 4,965,846
313 4,964,740
475 4,964,741
515 4,964,742

CLASS 388

814 4,965,847
815 4,965,848

CLASS 392

407 4,965,434

CLASS 400

208.1 4,964,743

CLASS 401

6 4,964,744
131 4,964,745

CLASS 402

25 4,964,746

CLASS 403

24 4,964,747
55 4,964,748
169 4,964,749

CLASS 404

6 4,964,750
25 4,964,755
35 4,964,751
92 4,964,752
122 4,964,753
123 4,964,754

CLASS 405

26 4,964,756
30 4,964,757
66 4,964,758
154 4,964,759
215 4,964,760
286 4,964,761

CLASS 407

34 4,964,762
40 4,964,763

CLASS 409

136 4,964,764
181 4,964,765
225 4,964,766

CLASS 410

65 4,964,767
94 4,964,768
118 4,964,771

CLASS 411

82 4,964,772
373 4,964,773
446 4,964,774

CLASS 414

12 4,964,775
277 4,964,776
401 4,964,777
700 4,964,778
708 4,964,779
728 4,964,780
790.7 4,964,781
798.1 4,964,782

CLASS 415

52.1 4,964,783

CLASS 417

86 4,964,784
360 4,964,785
363 4,964,786
4,964,787
422 4,964,788
437 4,965,042
494 4,964,789

CLASS 418

1 4,964,790

CLASS 419

8 4,965,043
12 4,965,044

CLASS 420

478 4,965,045
519 4,965,046

CLASS 422

54 4,965,048
58 4,965,047
68.1 4,965,049
100 4,965,050
145 4,965,051
187 4,965,052

CLASS 423

21.5 4,965,053
112 4,965,054
140 4,965,116
263 4,965,056
4,965,057
325 4,965,058
328 4,965,059
376 4,965,060
484 4,965,061
492 4,965,055
576.7 4,965,062

CLASS 424

7.1 4,965,063
9 4,965,064
10 4,965,065
40 4,965,078
45 4,965,066
52 4,965,067
87 Re.33,403
4,965,068
89 4,965,069
401 4,965,071
449 4,965,074
458 4,965,072
581 4,965,070
638 4,965,075

CLASS 425

8 4,964,791
32 4,964,792
62 4,964,793
117 4,964,794
144 4,964,795

CLASS 426

18 4,965,076
4,965,077
43 4,965,079
104 4,965,080
242 4,965,081
331 4,965,082
422 4,965,083
4,965,084
533 4,965,085
636 4,965,086

CLASS 427

2 4,965,087
4,965,088
3 4,965,089
39 4,965,090
64 4,965,091
96 4,965,092
109 4,965,093
125 4,965,094
142 4,965,095
165 4,965,096
230 4,965,099
242 4,965,100
255 4,965,101
374.4 4,965,102

CLASS 428

31 4,965,103
34.1 4,965,104
34.2 4,965,105
4,965,106
34.4 4,965,107
35.7 4,965,108
4,965,109
36.4 4,965,110
36.8 4,965,111
36.91 4,965,112
40 4,965,113
64 4,965,114
131 4,965,115
137 4,965,118
182 4,965,117
192 4,965,119
194 4,965,097
203 4,965,098
213 4,965,120
4,965,121
225 4,965,122
314.4 4,965,123
327 4,965,124
329 4,965,125
343 4,965,126
4,965,127
398 4,965,128
4,965,129
407 4,965,130
4,965,131
411.1 4,965,132
4,965,133
4,965,134
412 4,965,135
414 4,965,136
432 4,965,137
593 4,965,138
682 4,965,139
698 4,965,140

CLASS 429

9 4,965,141
11 4,965,142
17 4,965,143
55 4,965,144
101 4,965,145
102 4,965,146
136 4,965,147
159 4,965,148
168 4,965,149
191 4,965,151
194 4,965,150

CLASS 430

1 4,965,152
11 4,965,153
58 4,965,154
4,965,155
66 4,965,156
80 4,965,157
106.6 4,965,158
108 4,965,159
4,965,160
109 4,965,161
110 4,965,162
114 4,965,163
128 4,965,164
138 4,965,165
156 4,965,166
191 4,965,167
204 4,965,168
264 4,965,169
4,965,170
288 4,965,171
291 4,965,172
292 4,965,073
317 4,965,173
340 4,965,174
375 4,965,175
378 4,965,176
405 4,965,177
495 4,965,178
504 4,965,179
518 4,965,180
550 4,965,181
576 4,965,182

578 4,965,183
603 4,965,184

CLASS 431

289 4,964,796
328 4,964,797

CLASS 432

23 4,964,798
59 4,964,799

CLASS 433

3 4,964,800
173 4,964,801
214 4,964,769
223 4,964,770

CLASS 434

96 4,964,802
118 4,964,803
219 4,964,804

CLASS 438

1 4,965,185
2 4,965,186
5 4,965,187
6 4,965,188
4,965,189
4,965,190
7 4,965,191
4,965,192
18 4,965,193
25 4,965,194
69.52 4,965,195
69.6 4,965,199
69.8 4,965,197
70.21 4,965,198
125 4,965,200
134 4,965,201
170 4,965,202
188 4,965,203
240.27 4,965,204
252 4,965,205
291 4,965,206
320 4,965,207
691 4,965,196

CLASS 436

5 4,965,208
32 4,965,209
97 4,965,210
543 4,965,211

CLASS 437

4 4,965,212
21 4,965,213
24 4,965,214
31 4,965,215
4,965,216
32 4,965,217
40 4,965,219
41 4,965,218
59 4,965,220
70 4,965,221
81 4,965,222
127 4,965,223
132 4,965,224
173 4,965,225
189 4,965,226
207 4,965,227

CLASS 439

63 4,964,805
79 4,964,806
169 4,964,807
264 4,964,808
357 4,964,809
368 4,964,810
398 4,964,811
403 4,964,812
521 4,964,813
607 4,964,814
610 4,964,815
669 4,964,816
701 4,964,817
751 4,964,818
773 4,964,819

CLASS 440

7 4,964,820
38 4,964,821
50 4,964,822
61 4,964,823

CLASS 441

57 4,964,824
59 4,964,827
74 4,964,825
79 4,964,826

CLASS 445

4 4,964,828
22 4,964,829

CLASS 446

71 4,964,830
75 4,964,831
100 4,964,832
118 4,964,833
4,964,834
154 4,964,835
374 4,964,836
409 4,964,837

CLASS 455

33 4,965,850
34 4,965,849
52 4,965,851
82 4,965,852
209 4,965,853
224 4,965,854
344 4,965,855
617 4,965,856
618 4,965,857
619 4,965,858

CLASS 460

66 4,964,838

CLASS 464

29 4,964,839
125 4,964,840

CLASS 474

11 4,964,841
152 4,964,842

CLASS 475

34 4,964,843
215 4,964,316
295 4,964,844

CLASS 494

52 4,964,845

CLASS 501

12 4,965,228
14 4,965,229
89 4,965,231
128 4,965,230

CLASS 502

43 4,965,232
65 4,965,233
154 4,965,234
209 4,965,235
211 4,965,236
304 4,965,243

CLASS 503

209 4,965,237
227 4,965,238
4,965,239
4,965,240
4,965,241
4,965,242

CLASS 505

1 4,965,244
4,965,245
4,965,246
4,965,247
4,965,248
4,965,249

CLASS 514

8 4,965,251
18 4,965,250
54 4,965,252
4,965,253
89 4,965,254
128 4,965,255
4,965,256
149 4,965,257
158 4,965,258
183 4,965,259
192 4,965,260
229.5 4,965,261
230.2 4,965,262
247 4,965,263
248 4,965,264
250 4,965,265
253 4,965,266
4,965,267
4,965,268
4,965,269
262 4,965,270
263 4,965,271
288 4,965,272
300 4,965,273
311 4,965,274
354 4,965,275
378 4,965,276
381 4,965,279
383 4,965,280
385 4,965,277
399 4,965,281
406 4,965,282
414 4,965,278
422 4,965,283
443 4,965,284
4,965,285
514 4,965,286
531 4,965,287
649 4,965,288

CLASS 516

179 4,965,361

CLASS 521

53 4,965,289
54 4,965,290
64 4,965,291
110 4,965,292
124 4,965,293

CLASS 522

79 4,965,294

CLASS 523

109 4,965,295
179 4,965,296
217 4,965,297
306 4,965,298
437 4,965,299

CLASS 524

83 4,965,302
101 4,965,301
107 4,965,303
123 4,965,304
349 4,965,305
351 4,965,306
405 4,965,309
406 4,965,310
421 4,965,308
425 4,965,307
483 4,965,311
506 4,965,312

CLASS 525

59 4,965,313
60 4,965,314
86 4,965,315
100 4,965,316
155 4,965,317
179 4,965,318
194 4,965,319
207 4,965,320
329.7 4,965,321
332.6 4,965,322
349 4,965,323
415 4,965,300
507 4,965,324
508 4,965,325

CLASS 526

84 4,965,326
88 4,965,327
212 4,965,328
259 4,965,329
4,965,330
262 4,965,331

CLASS 528

25 4,965,332
33 4,965,333
34 4,965,334
108 4,965,335
170 4,965,336
272 4,965,338
353 4,965,337
4,965,339
382 4,965,340
392 4,965,341
417 4,965,342

CLASS 530

334 4,965,343
350 Re.33,405
351 4,965,344

CLASS 534

651 4,965,345
766 4,965,346

CLASS 536

1.1 4,965,347
6.4 4,965,351
4,965,352
17.2 4,965,348
27 4,965,349
28 4,965,350
55.1 4,965,353
124 4,965,354

CLASS 540

226 4,965,355
523 4,965,356

CLASS 544

309 4,965,357
357 4,965,358

CLASS 546

114 4,965,359
134 4,965,364
145 4,965,360
246 4,965,362

CLASS 548

109 4,965,365
110 4,965,366
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215 4,965,368
492 4,965,369
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561 4,965,363
952 4,965,371

CLASS 549

253 4,965,372
273 4,965,373
313 4,965,374
320 4,965,375
336 4,964,846
423 4,965,376
491 4,965,377
508 4,965,378
521 4,965,379

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12 4,965,380
18 4,965,381
79 4,965,382
104 4,965,383
110 4,965,384
416 4,965,385
430 4,965,386
440 4,965,387
472 4,965,388

CLASS 558

7 4,965,390
04 4,965,389
169 4,965,391
254 4,965,392
324 4,965,393
425 4,965,394

CLASS 560

11 4,965,395
21 4,965,396
60 4,965,397
4,965,398
64 4,965,399
130 4,965,400
210 4,965,401

CLASS 562

17 4,965,402
4,965,403
35 4,965,404
414 4,965,406
441 4,965,405

CLASS 604

4 4,964,847
6 4,964,848
35 4,964,849
54 4,964,850
74 4,964,851
75 4,964,852
96 4,964,853
166 4,964,854
192 4,964,866
283 4,964,855
326 4,964,856
385.1 4,964,858
4,964,859
391 4,964,860
395 4,964,857

CLASS 606

60 4,964,403
87 4,964,861
102 4,964,862
153 4,964,863

CLASS 623

3 4,964,864
19 4,964,865
20 4,964,867
4,964,868
23 4,964,869

CLASS 723

197 AB 4,964,374

CLASS 838

559 4,964,326

D2—	229	311,445	D7—	317	311,475	D12—	14	311,505		137	311,536			311,563		47	311,594
	315	311,446		605	311,476		96	311,506		165	311,537			311,564		85	311,596
	320	311,447		619	311,477		110	311,507			311,538		223	311,565		118	311,597
	331	311,448		666	311,479		111	311,508		221	311,539		234	311,567		133	311,598
D3—	38	311,449		686	311,478		131	311,509		226	311,521			311,568	D27—	172	311,599
	40	311,450	D8—	14	311,480		158	311,510		233	311,540		241	311,569		183	311,600
	62	311,451		36	311,481		162	311,511		240	311,541	D23—	209	311,570	D28—	9	311,601
	71	311,452		51	311,482		196	311,512		248	311,542		225	311,571		30	311,602
	100	311,453		86	311,483		317	311,513	D15—	17	311,543		235	311,572		31	311,603
D4—	106	311,454		353	311,485		337	311,514		127	311,544		262	311,573		64	311,595
	132	311,455		358	311,486	D13—	101	311,515		145	311,545		345	311,574		85	311,604
D6—	301	311,456		367	311,484		102	311,516	D16—	209	311,546		351	311,575		99	311,605
	314	311,457		396	311,487		146	311,517	D18—	4	311,547		371	311,576	D29—	5	311,606
	315	311,458	D9—	343	311,488			311,518	D19—	26	311,548		393	311,577		7	311,607
	318	311,474		367	311,489		152	311,519			311,549		409	311,578		10	311,608
	367	311,459		370	311,490		184	311,520		48	311,550	D24—	10	311,579		19	311,609
	379	311,460		385	311,491	D14—	100	311,523	D20—	17	311,551		17	311,580	D30—	109	311,610
	380	311,461		386	311,492			311,524		131	311,612		47	311,581		131	311,611
	455	311,462		416	311,493			311,525	D21—	59	311,552		50	311,582	D32—	21	311,613
		311,463		448	311,494		106	311,522			311,553	D25—	119	311,583			311,614
	461	311,464	D10—	15	311,495			311,527		71	311,554		122	311,584		32	311,615
		311,465		31	311,496			311,528		89	311,555			311,585			311,616
		311,466		46.1	311,501		114	311,526		105	311,556			311,586		68	311,617
		311,467		75	311,497		118	311,529		114	311,566		124	311,587		73	311,618
	487	311,468		82	311,498		126	311,530		130	311,557	D26—	24	311,588	D34—	3	311,619
	491	311,469		104	311,499			311,531			311,558			311,589		11	311,620
	601	311,470		106	311,500			311,532		150	311,559		35	311,590		18	311,621
		311,471	D11—	75	311,502			311,533			311,560		44	311,591		25	311,622
		311,472		79	311,504		135	311,534		166	311,561			311,592		40	311,623
	603	311,473		172	311,503			311,535		168	311,562		46	311,593			311,624

CLASSIFICATION OF PLANTS

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PATENTS

01 : 4,964,249	4,964,560	4,965,417	4,964,995	4,964,819	4,964,976
4,964,453	4,964,573	4,965,439	4,965,076	4,964,821	4,965,109
4,964,632	4,964,628	4,965,446	4,965,077	4,964,951	4,965,235
4,965,228	4,964,633	4,965,457	4,965,298	4,964,961	4,965,366
4,965,429	4,964,646	4,965,476	4,965,572	4,965,031	4,965,373
4,965,641	4,964,657	4,965,479	4,965,643	4,965,061	4,965,420
04 : Re.33,402	4,964,659	4,965,484	4,965,684	4,965,253	4,965,477
4,964,395	4,964,661	4,965,521	4,965,741	4,965,424	4,965,492
4,964,422	4,964,663	4,965,527	4,965,751	4,965,505	4,965,537
4,964,428	4,964,667	4,965,533	4,965,796	4,965,538	4,965,556
4,964,431	4,964,705	4,965,535	09 : 4,964,356	4,965,624	4,965,706
4,964,487	4,964,706	4,965,539	4,964,807	4,965,709	4,965,824
4,964,721	4,964,709	4,965,545	4,964,812	4,965,738	4,965,850
4,964,793	4,964,722	4,965,547	4,964,832	4,965,745	18 : 4,964,359
4,964,868	4,964,735	4,965,568	4,964,938	4,965,804	4,964,543
4,965,054	4,964,738	4,965,593	4,965,227	4,965,845	4,964,656
4,965,342	4,964,744	4,965,602	4,965,348	13 : 4,964,526	4,964,739
4,965,466	4,964,758	4,965,603	4,965,372	4,964,532	4,964,741
4,965,526	4,964,769	4,965,605	4,965,418	4,964,550	4,964,790
4,965,569	4,964,775	4,965,607	4,965,432	4,964,569	4,964,867
4,965,606	4,964,808	4,965,611	4,965,544	4,964,591	4,964,921
4,965,673	4,964,814	4,965,649	4,965,686	4,964,637	4,965,013
4,965,692	4,964,825	4,965,668	4,965,749	4,964,754	4,965,053
4,965,828	4,964,830	4,965,676	4,965,778	4,965,000	4,965,072
4,965,864	4,964,847	4,965,685	4,965,834	4,965,026	4,965,108
05 : 4,964,820	4,964,852	4,965,691	4,965,879	4,965,122	4,965,374
06 : 4,964,171	4,964,854	4,965,710	10 : 4,964,629	4,965,384	4,965,377
4,964,183	4,964,855	4,965,719	4,964,960	4,965,488	4,965,388
4,964,191	4,964,861	4,965,727	4,965,066	4,965,534	4,965,444
4,964,204	4,964,870	4,965,732	4,965,129	16 : 4,964,370	4,965,495
4,964,218	4,964,881	4,965,736	4,965,152	4,965,221	4,965,669
4,964,242	4,964,911	4,965,739	4,965,268	17 : Re.33,394	4,965,703
4,964,275	4,964,934	4,965,748	4,965,280	Re.33,397	4,965,704
4,964,282	4,964,970	4,965,761	4,965,281	4,964,179	4,965,859
4,964,303	4,964,979	4,965,782	4,965,325	4,964,189	19 : 4,964,256
4,964,304	4,965,049	4,965,795	4,965,386	4,964,225	4,964,899
4,964,311	4,965,106	4,965,800	4,965,394	4,964,228	4,965,267
4,964,316	4,965,121	4,965,805	4,965,540	4,964,278	4,965,332
4,964,339	4,965,145	4,965,819	4,965,742	4,964,287	4,965,694
4,964,344	4,965,173	4,965,821	11 : 4,965,071	4,964,392	4,965,760
4,964,353	4,965,188	4,965,842	12 : 4,964,180	4,964,495	20 : 4,964,351
4,964,406	4,965,196	4,965,846	4,964,220	4,964,539	4,965,801
4,964,409	4,965,199	4,965,865	4,964,354	4,964,578	21 : Re.33,395
4,964,439	4,965,210	4,965,868	4,964,355	4,964,595	4,964,250
4,964,440	4,965,211	4,965,869	4,964,360	4,964,602	4,964,829
4,964,472	4,965,215	4,965,872	4,964,384	4,964,613	4,964,831
4,964,479	4,965,223	08 : 4,964,755	4,964,430	4,964,614	4,964,999
4,964,491	4,965,252	4,964,802	4,964,488	4,964,682	4,965,552
4,964,508	4,965,257	4,964,837	4,964,528	4,964,730	22 : 4,964,604
4,964,527	4,965,336	4,964,941	4,964,574	4,964,774	4,964,782
4,964,542	4,965,349	4,964,948	4,964,600	4,964,919	4,965,304
4,964,544	4,965,368	4,964,955	4,964,627	4,964,936	23 : 4,964,630
4,964,557	4,965,371	4,964,984	4,964,693	4,964,975	4,965,187

24 : 4,964,174
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34 : Re.33,396
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DESIGN PATENTS

01 :	311,480		311,592		311,593	29 :	311,457		311,546		311,578
	311,544		311,594	18 :	311,486		311,497		311,558		311,591
	311,573	09 :	311,556		311,579		311,545		311,566		311,598
04 :	311,522	10 :	311,587	20 :	311,513		311,605		311,567	41 :	311,447
06 :	311,451	12 :	311,468		311,584		311,609		311,590		311,536
	311,471		311,555		311,585		311,619		311,610	42 :	311,485
	311,477		311,562		311,586	32 :	311,460	37 :	311,453		311,615
	311,489		311,563	21 :	311,445		311,474		311,483		311,624
	311,492		311,564	22 :	311,623		311,595		311,569	47 :	311,516
	311,506		311,568	24 :	311,454	34 :	311,462		311,608	48 :	311,565
	311,520		311,577		311,472		311,463	39 :	311,469		311,582
	311,588		311,583		311,548		311,464		311,470	50 :	311,574
	311,596		311,602	26 :	311,487		311,465		311,482	51 :	311,493
	311,599	13 :	311,455		311,500		311,466		311,494		311,612
	311,600		311,456		311,503		311,467		311,508		311,621
	311,616		311,606		311,505		311,542		311,509	53 :	311,580
	311,617	17 :	311,461		311,601		311,570		311,519		311,581
	311,622		311,478	27 :	311,448		311,618		311,551		311,620
08 :	311,449		311,495		311,488	36 :	311,450		311,561	55 :	311,499
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	311,511		311,554		311,552		311,473				

PLANT PATENTS

06 :	7,364	7,367	53 :	7,363	

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